



~~Wolfden Mt. Chase LLC~~

**Petition to Rezone Portion of Township 6, Range 6
Penobscot County, Maine for Development of an
Underground Metallic Mineral Deposit**

Prepared by:
Wolfden Mt. Chase LLC

Submitted to:

Maine Land Use Planning Commission



WOLFDEN

Date: ~~January 26, 2020~~ Sept 1, 2021

~~Revised June 30, 2020~~



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Tracking No.

ZP

Permit No.

Fee Received

Applicant and Agent Information – LUPC Application for Zone Change

APPLICANT INFORMATION

Please Print Legibly

Applicant Name(s) Wolfden Mt. Chase LLC; a wholly owned subsidiary of Wolfden Resources Corporation	Title (if representing a corporation) Ron Little, President and CEO of Wolfden Resources Corp	
	Phone (613) 862 3699	
Mailing Address 1100 Russell Street Unit 5	Email rlittle@wolfdenresources.com	
Town Thunderbay	State Ontario, Canada	Zip Code P7B 5N2

AGENT INFORMATION (If applicable)

Agent Name(s)	Phone	
Business Name		
Mailing Address	Email	
Town	State	Zip Code

APPLICANT AND AGENT SIGNATURES

I have personally examined and am familiar with all information submitted in this application, and to the best of my knowledge, it is true, accurate, and complete. I am aware that there may be significant penalties for submitting false information. I understand that the applicant is responsible for complying with all conditions of any permits issued by the Land Use Planning Commission.

If signing this document on behalf of a corporation, partnership, trust, or other legal entity, I affirm that I am authorized to bind the entity and execute legal agreements on its behalf.

Please check **one** of the boxes below:

☐ I authorize staff of the Land Use Planning Commission to access the project site as necessary between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday.

☒ I request that staff of the Land Use Planning Commission make reasonable efforts to contact me in advance to coordinate access to the project site.

Authorization of Agent by Applicant: By signing below, I authorize the individual or business listed above to act as my legal agent in all matters relating to this application.

Applicant Signature:  Date: _____

Agent Signature: _____ Date: September 01/2021

Revised: 3/24/2021



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Fee Received

Property Information – LUPC Application for Zone Change

PROPERTY INFORMATION. Provide the following details about your property location. Tax map, plan, and lot numbers are listed on your property tax bill. If you lease your property, check your lease to find out whether any unique lease lot numbers have been assigned to the property.

Applicant Wolfden Mt. Chase LLC	Township, Town or Plantation T6R6 WELS, Maine	County Penobscot
Tax Map, Plan, and Lot Numbers <i>[list all applicable; check tax bill(s)]</i> Map 1 Lot 2		
Lot size <i>(in acres, or in square feet if less than 1 acre)</i> 7,145 acres	Deed Book and Page #'s, and lease information if applicable <i>(include any lessor or lease lot numbers assigned by a property owner)</i> Book: 14672, Page: 27	
All Zoning on Property <i>(check the LUPC Land Use Guidance Map)</i> M-GN, P-GP, P-WL1, P-WL-2, P-WL3, P-SG, P-SL2	Zoning at Development Site M-GN	
Road Frontage: List the name(s) and frontage(s) (in feet) for any public or private roads, or other rights-of-way adjacent to your lot: Road #1 ____ NA _____ Frontage ____ ft. Road #2 _____ Frontage ____ ft.	Water Frontage: List the name(s) and frontage(s) (in feet) for any lakes, ponds, rivers, streams (named and unnamed), or coastal wetlands on or adjacent to your lot: Waterbody #1Pickett Mountain Pond Frontage_17300ft. Waterbody #2Pleasant and Mud LakesFrontage 48860ft.	
If there is no road frontage, describe the access for the property. Access to the property is via route 11 then into the property via a series of maintained gravel logging roads. Details are discussed in Exhibit 20 of this Petition.		
LUPC Approved Subdivision: If the lot is part of an LUPC approved subdivision, provide the subdivision permit and lot numbers: Subdivision Permit # _____ and Lot # _____ <i>(usually included in deed description)</i>		
BRIEF PROJECT SUMMARY <i>(include proposed zoning if submitting an application for zone change)</i> Wolfden Resources is requesting rezoning of a 600.1 acre parcel of land from M-GN to D-PD for a proposed mining and concentration project located in T6R6 WELS, Maine. Details of the proposal are submitted to the LUPC for review and consideration in the following series of Exhibits.		
Proposed Project Name <i>(if applicable)</i> Pickett Mountain Project		

Revised: 3/24/2021



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Exhibit B — Deed, Lease or Easement

Exhibit C — Site Photographs

Exhibit D-1 — Existing Site Plan

Exhibit D-2 — Preliminary Site Plan or Subdivision Plan

Exhibit E — Flood Area Zoning Not Applicable

Exhibit F — Notice of Filing

Exhibit G — Protection Subdistricts Not Applicable

Exhibit H — **Financial Capacity**

Exhibit I — Corporate Good Standing

Exhibit J — Soil Suitability and Mapping

Exhibit K — Wastewater Disposal

Exhibit L — Impacts on Public Services

Exhibit M — Archaeological Resources

Exhibit N — Rare or Special Plant Communities and Wildlife Habitat

APPENDICES

Appendix A — Chapter 12 Requirements for Mining and Level C Mineral Exploration Activities

Appendix A — Attachments:



- Attachment A — A narrative description of the nature and basis for the subdistrict change being requested.
- Attachment B — A legal description and delineation of the property boundaries proposed for redistricting, including names, addresses and affiliations of current owners and any other entities having a legal interest in the property.
- Attachment C — Names and addresses of property owners located within 1,000 feet of the subject property.
- Attachment D — A preliminary plan for general location and timing of the elements of the Pickett Mountain Mine project.
- Attachment E — A location map drawn to scale on the most recent version of the USGS topographic map and a LUPC Land Use Guidance Map that indicates the area for which a D-PD Development Subdistrict designation is sought and the estimated boundaries of the ore body proposed to be explored or mined.
- Attachment F — A map drawn to scale of at least 1 inch to 100 feet showing existing site conditions, including contours at 10 foot intervals or less, water courses, unique or unusual natural conditions, forest cover, wetlands, known or likely deer wintering areas, lakes, ponds, existing structures, road and transportation routes, property boundaries and names of adjoining property owners, scenic locations and other prominent topographical and natural resource features.
- Attachment G — A soils map of low intensity that encompasses those portions of the property proposed for D-PD Development Subdistrict designation, including identification of soils used in the USDA Soil Series.
- Attachment H — Surficial and bedrock geology maps at a scale of 1:24,000, or largest scale available, of the property proposed for D-PD Development Subdistrict designation.
- Attachment I — A map and or description of the location of public, private and industrial water supplies as well as mapped aquifers located within a three-mile radius of the mining area or exploration site;
- Attachment J — A map and description of the location and extent of existing infrastructure to include roadways and transportation routes to be



utilized, potential impacts on this existing infrastructure, as well as infrastructure to be constructed or improved.

- Attachment K — A map identifying significant natural resources and sensitive natural areas located within a three-mile radius of the mining area or exploration site including protected water bodies, significant wildlife and plant areas, fragile mountain areas, historic sites, scenic resources, public lands, registered critical areas, and LUPC subdistricts.
- Attachment L — A map and description of existing uses, such as recreational, within a three-mile radius of the mining area or exploration site.
- Attachment M — A description of general measures that may be undertaken to assure that mining in the specified location will not have undue adverse impacts on existing uses, resources and measures that a permittee may take to avoid, minimize or mitigate any adverse impacts;
- Attachment N — A description of socioeconomic impacts, both positive and negative, of the proposed metallic mineral mining or level C mineral exploration activities upon the immediate area and communities within and adjacent to the LUPC's jurisdiction likely to be affected by the proposed activities, as well as to the county and state.
- Attachment O — An evaluation of the sufficiency of existing services and utilities, a description of any general measures necessary to increase those service capacities and an examination of the burdens on communities or government to provide those services.
- Attachment P — An explanation of how this proposal is consistent with the standards and purpose of the D-PD Development Subdistrict.
- Attachment Q — A description of the anticipated site conditions following closure and the potential for future reclamation and beneficial use of the affected area.
- Attachment R — Proposed Land Use Activities and Structure Allowed in the Picket Mountain (D-PD) Planned Development Subdistrict



Ag	_____	Silver
Au	_____	Gold
AAPT	_____	Average Annual Daily Transportation
AM	_____	Ante Meridiem – (before noon)
ATV	_____	All-Terrain Vehicle
CLUP	_____	Comprehensive Land Use Plan
Cu	_____	Copper
DEP	_____	Maine Department of Environmental Protection
DOT	_____	Department of Transportation
dB	_____	Decibels
EL	_____	Elevation
ft	_____	Feet
IF&W	_____	Inland Fisheries and Wildlife
IG	_____	<u>Infiltration Galleries</u>
LMA	_____	Local Market Area
LUPC	_____	Land Use Planning Commission
M	_____	Million
MDIF&W	_____	Maine Department Inland Fisheries and Wildlife
MEDOT	_____	Maine Department of Transportation
MHPC	_____	Maine Historic Preservation Commission
Mi	_____	Miles
MNAP	_____	Maine Natural Areas Program (Department of Conservation)
M-GN	_____	General Management
MRSA	_____	Maine Revised Statutes
M ³ /d	_____	Cubic meters/day
NWI	_____	National Wetlands Inventory
Pb	_____	Lead



P-DP _____Planned Development
PM _____Post Meridiem (after noon)
% _____ Percent
RSU _____Regional School Unit
RTE _____Rare Threatened or Endangered
SR _____State Route
TMF _____Tailings Management Facility
T _____Tonnes
tpd or t/d Tonnes per day
UNK _____Unknown
Zn _____Zinc



References

06-096 CMR Chapter 200.

01-672 CMR Chapter 10, Section 21, H(D-PD),1.

Maine Land Use Planning Commission, Guidance for Interpretating the 2010 Comprehensive Land Use Plan, Approved October 5, 2012, at p. 3.

Maine Land Use Planning Commission, Guidance for Interpretating the 2010 Comprehensive Land Use Plan, Approved October 5, 2012, at p. 3.

Comprehensive Land Use Plan, Chapter 1, Section 1.2.G, at p. 15.

Gerber and Hebson, 1996 in Geologic Society of Maine, Bulletin 4-, Selected Papers on the Hydrology — of Maine. Pages 23-52.

Tracking No.	Tracking No.	Tracking No.
Tracking No.	Tracking No.	Tracking No.
Tracking No.	Tracking No.	Tracking No.

Zoning Petition

for Petitions to Rezone to Most Subdistricts

If you propose to rezone any portion of your land area to a Resource Plan Protection (P-RP) Subdistrict, STOP HERE!
You cannot use this form. Contact the LUPC office that serves your area if you have questions.

1A. PETITIONER INFORMATION

Petitioner Name(s) Wolfden Mt. Chase LLC; a wholly owned subsidiary of Wolfden Resources Corporation	Petitioner Title (if representative of a corporation, etc.) Ron Little, President and CEO of Wolfden Resources Corporation; Sole Owner of Wolfden Mt. Chase LLC
Daytime Phone (613) 862 3699	FAX (if applicable)
Mailing Address 1100 Russell Street Unit 5	Email (if applicable) rlittle@wolfdenresources.com
{	State Ontario Zip Code P7B 5N2

1B. AGENT INFORMATION (If applicable)

Agent Name(s)	Daytime Phone	FAX (if applicable)
Business Name		
Mailing Address	Email (if applicable)	
Town	State	Zip Code

2. PETITIONER AND/OR AGENT SIGNATURES


Petitioner: All persons, or authorized representatives of corporations, listed on the deed(s), lease(s) or sales contract as owners or lessees of the property must read the following statement and sign below.

- ☐ If an Agent is listed above, I hereby authorize that individual or business to act as my legal agent in all matters relating to this petition.
- ☒ If an Agent is not listed above, I have personally examined and am familiar with the information submitted in this petition, including the accompanying exhibits and supplements, and to the best of my knowledge and belief, this petition is complete with all necessary exhibits. The information in this petition is a true and adequate depiction of what currently exists on, and what is proposed at, the property. I understand that I am ultimately responsible for complying with all regulations, conditions and limitations of any petitions and permits issued to me by the Commission.

Please check **one** of the boxes below: (see "Accessing the Project Site for Site Evaluation and Inspection" just prior to the application form)

- ☒ I authorize staff of the Land Use Planning Commission to access the project site as necessary at any reasonable hour for the purpose of evaluating the site to verify the application materials I have submitted, and for the purpose of inspecting for compliance with statutory and regulatory requirements, and the terms and conditions of my permit.
- ☐ I request that staff of the Land Use Planning Commission make reasonable efforts to contact me in advance to obtain my permission to fully access the project site for purposes of any necessary site evaluation and compliance inspection.

The person(s) signing below must demonstrate that they have a legal right to apply for this petition, either as the petitioner or Maine DEP a legal agreement or other written contract with the petitioner. (See Exhibit B).

Petitioner Signature  Date 1/26/20

Agent: All agents listed above must read the following statement and sign below.

I understand that I am hereby authorized by the above listed petitioner to act as their legal agent in all matters relating to this zoning petition. I have personally examined and am familiar with the information submitted in this petition, including the accompanying exhibits and supplements, and to the best of my knowledge and belief, this petition is complete with all necessary exhibits. I understand that if the petition is incomplete or without any required exhibits that it will result in delays in processing the petition. The information in this petition is a true and adequate depiction of what currently exists on, and what is proposed at, the property. I certify that I will provide any final action by the Commission on this petition and associated conditions to the petitioner. I will ensure that the petitioner understand that they are ultimately responsible for complying with all regulations, conditions and limitations of any petitions and permits issued by the Commission as they regard this property.

If the petitioner has not signed above, the petition must include legal documentation designating the agent listed above as a representative of the petitioner in matters such as these. (See Exhibit B).

Agent Signature _____ Date _____

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3. PROPERTY LOCATION. Provide the following details about your property location. Tax plan and lot numbers are listed on your property tax bill. Book and page numbers are listed on your deed. If you lease your property, check your lease to find out whether any unique lease lot numbers have been assigned to the property.

Township, Town or Plantation <u>T6R6 WELS, Maine</u>		County <u>Penobscot</u>	
<p> If your property is located in one of the following Prospectively Zoned Plantations or Townships, please contact the LUPC office that serves your area prior to completing this form: Adamstown Twp., Dallas Plt., Lincoln Plt., Magalloway Plt., Rangeley Plt., Richardsontown Twp., Sandy River Plt., Township C, Township D, or Township E.</p>			
Tax Information (check tax bill)		Deed or Lease Information (check deed or lease)	
Map: <u>1</u>	Plan: _____ Lot: <u>2</u>	Book: <u>14672</u>	Page: <u>27</u>
Map: _____	Plan: _____ Lot: _____	Lease #: _____	Page: _____
Map: _____	Plan: _____ Lot: _____	Lease #: _____	
Lot size <u>7,145 Acres</u> (in acres, or in square feet if less than 1 acre)		Lot Coverage (in square feet)	
All Current Zoning on Property (check the appropriate <u>LUPC map</u>) <u>M-GN, P-GP, P-WL 1, P-WL 2, P-WL 3, P-SG, P-SL 2</u>		Current Zoning at Development Site: <u>M-GN</u>	
Road Frontage. List the name(s) and frontage(s) (in feet) for any public or private roads, or other rights-of-way adjacent to your lot:		Water Frontage. List the name(s) and frontage(s) (in feet) for any lakes, ponds, rivers, streams, or other waters <u>on or (&) adjacent</u> to your lot:	
Road #1 <u>NA</u> _____ Frontage _____		Waterbody #1 <u>Pickett Mountain Pond</u> _____ Frontage <u>17,300 ft.</u>	
ft. Road #2 _____ Frontage _____		Waterbody #2 <u>Pleasant and Mud Lakes</u> _____ Frontage <u>48,860 ft.</u>	
<p> Provide, as EXHIBIT A, a location map. See page iv of the instructions for more detail regarding this exhibit.</p> <p> Provide, as EXHIBIT B, your deed, lease or easement. See page iv of the instructions for more detail regarding this exhibit.</p>			

4. PROJECT DESCRIPTION. Provide a brief summary of your proposal, including a general description of the project, including proposed development, number of lots (if applicable), roads, and land use activities.

The proposed development includes construction of facilities necessary for development, operation and closure of an underground metallic mineral mine. Access to the mine operations area will be by existing gravel roads that will be subject to ongoing maintenance and improvements for safety. The area to be rezoned from a General Management (M-GN) to a Planned Development (D-PD) subdistrict encompasses approximately 528.2 acres. Impervious surfaces represent a total of 17.5% of the proposed footprint and 1.3% of the wholly owned 7145 acre parcel. Building structures represent an area of 2.8 acres, lined facilities and impervious areas represent an area of 89.7 acres (including 78.4 acres for a lined tailings facility). An additional 22.8 acres outside of the proposed boundary is required for access road upgrades. The total impacted or cleared area within the proposed boundary for rezoning is 105.7 acres. The total impacted area including access road upgrades leading to the property is 128.5 acres.

The project will be completed in four phases:

- Phase 1 Permitting
- Phase 2 Construction
- Phase 3 Operations
- Phase 4 Restoration, Reclamation and Monitoring

Proposed Zoning. List all proposed zoning designations (contact the LUPC office that serves your area if you have questions).

If your proposal includes rezoning lands to or from one of the following subdistricts, be sure to provide as **EXHIBIT G**, the necessary documentation, data, and/or maps that support the proposed change:

Aquifer Protection (P-AR) Subdistrict;	Fish and Wildlife Protection (P-FW) Subdistrict;
Soil and Geology Protection (P-SG) Subdistrict; or	Wetland Protection (P-WL) Subdistrict

See page v of the instructions for more detail regarding this exhibit.

Proposed Project Name (if applicable) **Pickett Mountain Mine**

A-Z Mining Professionals Limited, 2020, Preliminary Economic Assessment Pickett Mountain Project

McCollough, 2007. Canada lynx habitat management guidelines for Maine, USFWS Maine Field Office, 1168 Main St, Old Town, Maine 04468, September 13, 2007.

Executive Summary

Introduction/Location

Wolfden Mount Chase LLC. Is a junior mining company with specific interest in a high-grade poly-metallic resource in Penobscot County, Maine named Pickett Mountain. The Pickett Mountain project is a state-of-the-art proposal to mine zinc, lead, copper, silver and gold from a high-value deposit in Pickett Mountain, located in T6 R6, Penobscot County, Maine. These metals are in high demand globally and are used in a variety of applications such as cell phones, automobiles (including electric vehicles), electronics, low-carbon power generation, construction, and infrastructure. In 2017, Maine enacted the most stringent mining regulations in the nation (and likely all of North America), and the Pickett Mountain project will show-case mining techniques that allow for responsible and safe extraction of metals that are key to our future.

Specifically, Maine’s mining regulations include the following among other key provisions:¹

- Prohibition on open-pit mining
- Prohibition on wet storage of tailings
- Requirement for dry stack tailings management in engineered, lined facilities
- Prohibition on wet mine waste storage following closure
- Prohibition on contamination of ground or surface waters
- Restrictions on where mining can occur to avoid impacts to surface waters and sensitive resources
- Extensive baseline surveys to monitor groundwater (at least two years), wildlife and habitat
- Extensive monitoring and reporting requirements throughout the life of the mine and for 30 years following mine closure
- Fully funded financial assurance sufficient to cover all costs associated with a worst-case catastrophic mining event or failure
- Extensive provisions for public participation in the permitting process

This petition is part one of a two-step regulatory process due to the project location in an unorganized territory. Part one requires rezoning the proposed footprint from General Management (M-GN) to a Planned Development (D-PD) subdistrict. The purpose of the D-PD subdistrict is to allow large-scale well-planned development that depends on a particular natural feature or location that is available at the site. A petition “will be granted when the Commission concludes the location of the site is the best reasonably available for the proposed use and that the goals and policies of the Comprehensive Land Use Plan are served.”² To demonstrate the feasibility of the project and compliance with applicable rezoning criteria, the petition includes data on the site and surrounding resources and uses, the anticipated economic impact of the project, the processes and activities used in removal and processing of metals from the site, how waste material, including tailings, will be managed, the design of the water treatment facility to ensure that any discharges to groundwater will be at or below background levels, and other measures to ensure that the project will not have an adverse impact on the environment or surrounding uses. It is important to note, however, that the data in the petition reflects the fact that the final design of the project cannot occur until the required baseline surveys at the site have been completed. That process, which will require review and approval of the baseline surveys by the Maine Department of Environmental Protection (DEP) and allows input from the public on the work plan for the surveys, is expected to take two years.

¹ 06-096 CMR Chapter 200.

² 01-672 CMR Chapter 10, Section 21, H(D-PD),1.

It is important to place the rezoning process in this larger context of regulation of mining and the additional process that will occur following any rezoning and prior to approval to commence mining. Indeed, the Commission has noted the significance of statutory changes that vested the DEP with responsibility for permitting larger developments located in the unorganized territory and stated that these changes reflect "the intent that the Commission operate less as a reactive regulatory agency focused on protection of the jurisdiction through project specific permitting and rezoning, and serve more as a forward-looking planning agency focused on helping residents, landowners, and people of the State to ensure a vibrant and sustainable future for the unorganized and de-organized areas of Maine."³ In balancing its planning and zoning objectives, the Commission has placed increased emphasis on:

- Serving the regions in which the unorganized and de-organized areas are located;
- Honoring the rights and participation of residents and property owners; and,
- Encouraging and facilitating regional economic viability.⁴

A specific goal in the 2010 Comprehensive Land Use Plan (CLUP), which governs development in the jurisdiction, is to "allow environmentally responsible exploration and mining of metallic and non-metallic mineral resources where there are not overriding, conflicting public values which require protection."⁵ As described in the petition, the Pickett Mountain project will be well screened from surrounding uses and will be operated in a manner fully protective of water and other environmental resources. The Pickett Mountain project will resemble no other mine that has been planned or operated in Maine. In addition to the significant economic opportunities it offers, it will allow Maine to be a leader in showcasing responsible mining carried out in accordance with the strictest rules in the country, and in a manner consistent with the goals and policies of the CLUP and the rezoning requirements for a D-PD subdistrict.

Project Description

The proposed project is a small underground mine that is targeting the extraction of 1200 metric tonne per day. The proposal includes underground tunnels and excavations, an onsite concentrator and dry stack tailings management facility and all supporting infrastructure. Mined ore and waste rock brought to surface would be stockpiled in impermeable lined storage pads with leachate and stormwater collection systems and where contact water would be collected and treated to background or better water quality. The project duration is estimated at 10-15 years and the funds required for full reclamation of the project site would be funded up front by Wolfden and held in escrow or trust by the MDEP, before issuance of the permit by MDEP and the start of any construction work or excavations. The proposed project is consistent with D-PD development subdistrict standards and after reviewing several alternatives, Wolfden and its independent engineering consultants have concluded that the proposed project is in the most suitable location. The current site conditions are forested lands with minimal recreational resources in adjacent areas which includes 6 seasonable camps on the shores of nearby Pleasant Lake. Post closure and reclamation, the project will closely resemble its current state. All buildings and infrastructure will be demolished and disposed of off-site and the site re-graded and vegetated to its original condition. The only remaining facility would be the approximately 50-acre, 22 foot high dry-stacked tailings management facility constructed with impermeable bottom-liner, leachate collection system and impermeable cap. . Wolfden

³ Maine Land Use Planning Commission, Guidance for Interpretating the 2010 Comprehensive Land Use Plan, Approved October 5, 2012, at p. 3.

⁴ Maine Land Use Planning Commission, Guidance for Interpretating the 2010 Comprehensive Land Use Plan, Approved October 5, 2012, at p. 3.

⁵ Comprehensive Land Use Plan, Chapter 1, Section 1.2.G, at p. 15.

would conduct long term monitoring of groundwater, surface water and the tailings cap as long as required by MDEP.

As described in Exhibit 9 of the Petition, Pickett Mountain project is consistent with the Comprehensive Land Use Plan (CLUP).

Water Resources

Water at Pickett Mountain will be used for process water underground and on the surface in the concentrator building where raw, crushed ore will be processed. Water could be become impacted by contacting the sulfide bearing mine rock material or through the concentrator process. Impacted water is recycled into the variable processes with excess water removed from the circuit, treated to background or better water quality, then diffused back into the surrounding groundwater through a series of infiltration galleries (similar to typical septic fields). The infiltration galleries and overall water management plan have been developed to ensure there is no chemical or physical impact to wetlands, surface waters, or ground waters or the flora and fauna contained therein. Two independent consulting firms have completed reviews of previously submitted Preliminary Economic Assessment of Pickett Mountain as well as the previous petition update and have concluded that the water treatment aspects of the project appear feasible for the purpose of the rezoning.

Noise

Noise generated by construction or operation of Pickett Mountain will generally be controlled by enclosures. Major un-constrained noise makers are mobile equipment and fans that are operating outside and on surface. A complete noise impact evaluation has been completed and noise will not be impactful outside of the proposed site boundary.

Wildlife/Plant Habitat

Wildlife habitat has been evaluated based on review of readily available, public information published and provided by and MDIF&W and USFW. There is no known State of Maine rare, threatened or endangered species or significant wildlife habitat mapped within the area of rezoning. Pleasant Lake is classified as legacy trout water habitat by MDIF&W, and the State maintains a trout and land locked salmon fishery there. Pleasant Lake is outside the area to be rezoned. There is also an Inland Wading Bird and Waterfowl habitat adjacent to but outside of the rezone area and that will not be impacted by construction or operation of the project. There are three federal critical fish and wildlife habitats (Atlantic Salmon, Canada Lynx and Northern Long Eared Bat) in the area. None of these species has been observed in the area to be rezoned. The headwaters of Pleasant Lake and areas downstream have been modeled as potential Atlantic Salmon habitat, however there are several dams below Pleasant Lake that restrict upstream migration and no Atlantic Salmon has been observed in the streams and lakes near the project area. Nonetheless, no in-stream work is proposed and there will be buffers around wetlands and surface waters in the rezone area to minimize potential impacts to future Salmon habitat. The water management plan will ensure that there are no adverse impacts to surface waters from mine operation. Given the recent wood harvesting (5-to-10-year growth), the habitats for both the Canada Lynx and Northern Long-eared Bat is marginal. The amount of Lynx habitat impacted by the project is minimal and is not expected to adversely impact the species and tree clearing in the area will occur between November 1 and April 14 to minimize potential impacts to sensitive bat species. Finally, Wolfden will implement a number of measures on the remainder of its property to improve habitat for each of these species. It will support forest management practices that enhance the habitat for Lynx and bats and will implement measures to protect the modeled Atlantic Salmon habitat.

Soils

Low intensity soils evaluations have been completed on the proposed footprint and a series of soil types and depths have been identified. Additional information includes depth to the nearest constrained boundary (water, bedrock) as well as slope information etc. This data helped inform proposed layout designs and ultimately resulted in a series of options for infrastructure placement on the proposed site. There are currently no identified soils limitations to the proposed project that cannot be addressed through standard construction measures.

Financial Capacity

The financial capacity of the project is based on the anticipated cashflow and return on investment generated by the project over an assumed 10–15-year project life. Financing of a project will be generated through a combination of a project debt facility and equity raises which is estimated to have a 2-year payback period. In accordance with Chapter 200, all funding required to construct the site will be raised prior to construction beginning. This is inclusive of all money required to fund a worst-case scenario closure scenario. Money for the closure fund is put into a MDEP escrow account upfront before the project starts. This is significant assurance to the public that DEP holds sufficient funding even for a worst-case closure scenario and therefore, those unregulated mining disasters of the past, cannot occur under the new rules of Chapter 200. There is also further assurance the public that the financial merits of project is what is most important and not the financial capacity of the applicant of this petition. It is very common in the mining industry that projects are purchased by larger mining companies once they are close to securing a mining permit. Given that this is the first project to test the mining regulations of Maine in decades, such a scenario should not be overlooked.

Socio Economics

The positive socio economics generated from Pickett Mountain are significant. The project is estimated to generate 4,240 total job years (~300 jobs per year including direct, indirect and induced employment) with total earnings from the project of \$233.7 Million and total economic output of \$669.7 Million. Although not directly comparable to industry employment, to contextualize the impact of 300 additional jobs in the region, note that 13 of 19 industries in Houlton LMA and 17 of 19 industries in Millinocket LMA had annual employment less than 300 in 2020.

Harmonious Fit

The proposed project is anticipated to fit harmoniously within the area and its surroundings. The proposed location is generally surrounded by ridgelines which block visibility from all angles. There are two potential viewpoints to the project from an ATV trail along the north side of Mount Chase and from the hiking trail at the summit of Mount Chase. There will be no project visibility from the Katahdin Woods and Waters National Monument or Baxter State Park. Recreational resources will not be directly impacted by the project, and Wolfden will work with stakeholders to ensure that ATV and snowmobile trail connectivity remains intact.

Burden on Services

Services to the site have all been evaluated to confirm availability. Wolfden has been able to collect confirmations from the school board, fire and ambulance support, internet and communications, solid waste disposal, healthcare, and electricity supply. From an emergency response perspective, Pickett Mountain will be relatively self-reliant with minimal support for external services. All others will have minimal impact because they are paid for services or because Wolfden plans to hire a significant portion of employees locally and therefore impact to services will be minimized.

Public Roads

Access to the project site is via route 11 followed by 5.1 miles of gravel logging roads consisting of an unnamed road, Pleasant Lake Road, and Bear Mountain Rd. Traffic to the proposed site includes a peak of 66 workers per shift with two shifts per day offset by one hour. This results in a maximum of 132 peak hour trip/ hour during shift changes on ME SR-11. The roads have ample capacity to allow for added traffic caused by proposed operations. A series of improvements are anticipated to road infrastructure and are discussed in **Exhibit 20**.

Archeological and Historic Resources

The area is not considered sensitive for the presence of historical period archaeological resources. A Phase 0 Assessment included background research and a field inspection was completed by NE ARC Assistant Director, Dr. Gemma Hudgell. Background research considered various 19th and 20th century maps of the area, contemporary topographic and bedrock/ surficial geological maps, and review of MHPC site files associated with previously identified site 147.001. This research confirmed the potential presence of toolstone geological resources (rocks used for making tools) within the project area, possibly including chert and fine-grained volcanics, that can occur in many volcanic belts of the Appalachians.

Wolfdon Mt. Chase LLC

EXHIBIT 1 – DIRECTIONS AND LOCATIONS

1 DIRECTIONS AND LOCATIONS

The proposed project name is Pickett Mountain the site is located in T6 R6 Wels, Maine, roughly 9 miles north of Patten, Maine bordering both Penobscot and Aroostook Counties as shown in the following location map.

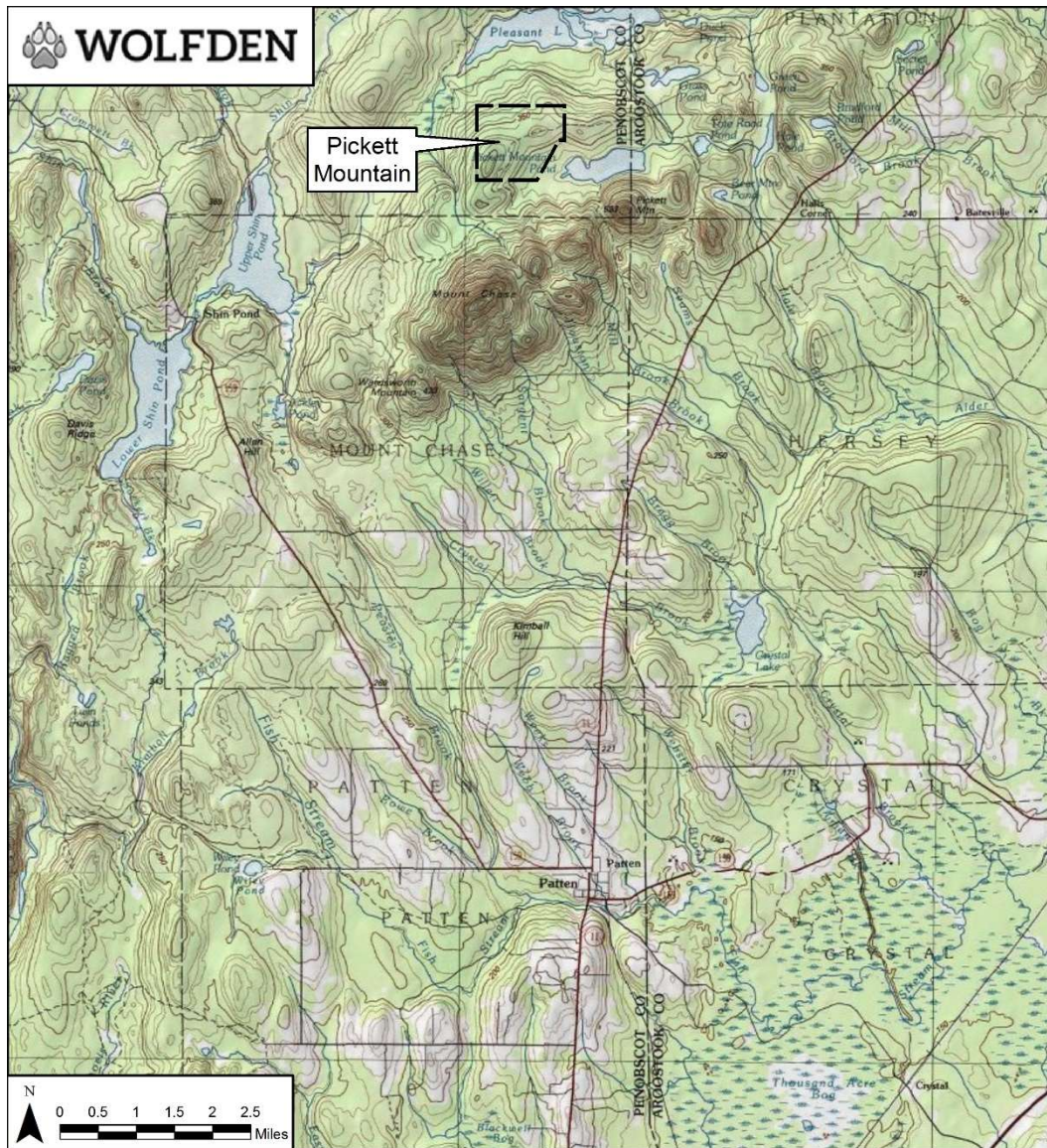


Figure 1-1-1: Pickett Mountain Location Map

Access to the project site is via an existing approximately 5-mile logging road that connects to Rt. 11 (**Figure 1-2**) Access and roadways are discussed in detail in **Exhibit 20** of this petition.

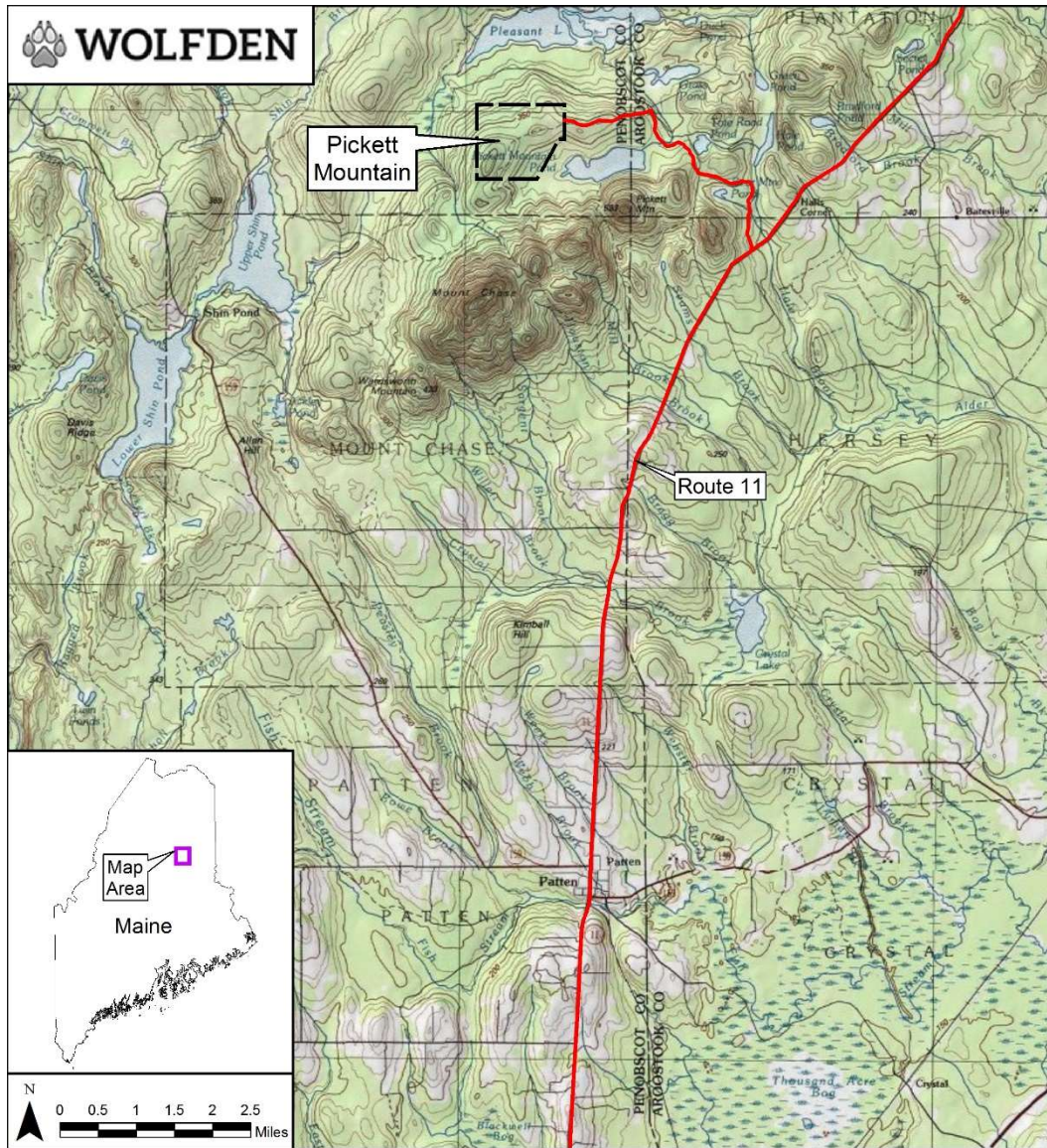


Figure 1-2: Pickett Mountain Access Map

Wolfden Mt. Chase LLC

EXHIBIT 2 – PROJECT DESCRIPTION

2 PROJECT DESCRIPTION

2.1 Development Zoning Proposal

The Wolfden Pickett Mountain planned development proposal includes the required above ground facilities to conduct underground mining and the onsite mineral processing of metallic minerals containing economic quantities of Zn, Cu, Pb, Au and Ag. Preliminary planning of the facilities results in a compact design of above ground buildings and structures for office, warehousing, mineral processing and beneficiation (mill feed storage pad, crushing, milling, and flotation), capture of contact waters (precipitation and mine waters), water treatment and infiltration galleries, and long term above ground management of tailings in conformance with Maine DEP regulations (dry stacked tailings facility). Underground facilities are accessed through a mine portal and shaft and are ventilated by above ground ventilation fans and shaft openings. The property location and project description, including phases of permitting, construction, operation and reclamation are presented in **Exhibit 1** and **Exhibit 2** of this petition as well as description of anticipated site conditions, reclamation and beneficial use of the affected area. **Exhibit 10** discusses impacts on existing uses and natural resources and approaches used to avoid and minimize adverse impacts and address impacts if they were to occur. **Exhibit 25** presents project environmental reviews by the Maine Natural Areas Program for rare and exemplary botanical features and the Maine Department of Inland Fisheries and Wildlife for important fisheries, wildlife and critical habitat resources in the vicinity of the proposed project. Plant and animal habitat resources, recreational resources, and scenic resources are also discussed in **Exhibits 10** and **15**.

- a. Sufficient Land Area: The project proposed area for rezoning, based on revisions necessary to address LUPC comments dated March 6, 2020, includes a total of 600.1 acres. The project will manage all tailings in the above ground dry stacked tailings management facility. In order to accommodate tailings placement, compaction and closure in a manner that minimizes vertical height of the placed tailings and allows the final closed facility to mimic the existing ridgeline, the tailings facility will occupy approximately 50.5 acres. The water treatment plant and infiltration galleries (IG's) are distributed throughout the property to distribute clean water infiltration into groundwater. The eight infiltration galleries occupy a footprint of 23.4 acres. Collectively the mine facilities (mill feed storage pad, waste rock staging area, concentrator, offices etc.) occupy a footprint of approximately 45.4 acres. Underground ventilation facilities are in the southwestern portion of the site. A 400-foot buffer between the rezone boundary and area of development has been established. No development will occur within the buffer zone. This buffer occupies approximately 347 acres. In addition, when developing the site layout, a 75-foot buffer around streams and wetlands was established and no development will occur within in this buffer. The overall footprint of the rezone area provides additional capacity and flexibility to adjust the sizes and locations of proposed facilities during the mine design and permitting phase, if requested by MDEP during the Metallic Mine Permitting application process, including the flexibility to avoid natural resource impacts such as critical species habitats that might be identified during the MDEP permitting phase. The additional area would also allow adequate space to locate and develop a potential renewable energy asset (solar farm), if future evaluations indicate such a facility is viable, and other project needs including parking and domestic wastewater facilities. Finally, if additional of ore reserves are identified to be mined, additional space has been provided to increase the size of the tailing's management facility expansion to the west of the current planned facility.

The project water management plan includes a sophisticated water treatment plant for all site waters (mine waters, contact water, precipitation and catchment waters) as described in **Exhibit 10**. Human contact

waters such as grey water and septic water will be managed through a contracted disposal service for the underground facilities and an on-site septic system for the above ground facilities discussed in more detail in **Exhibit 23**.

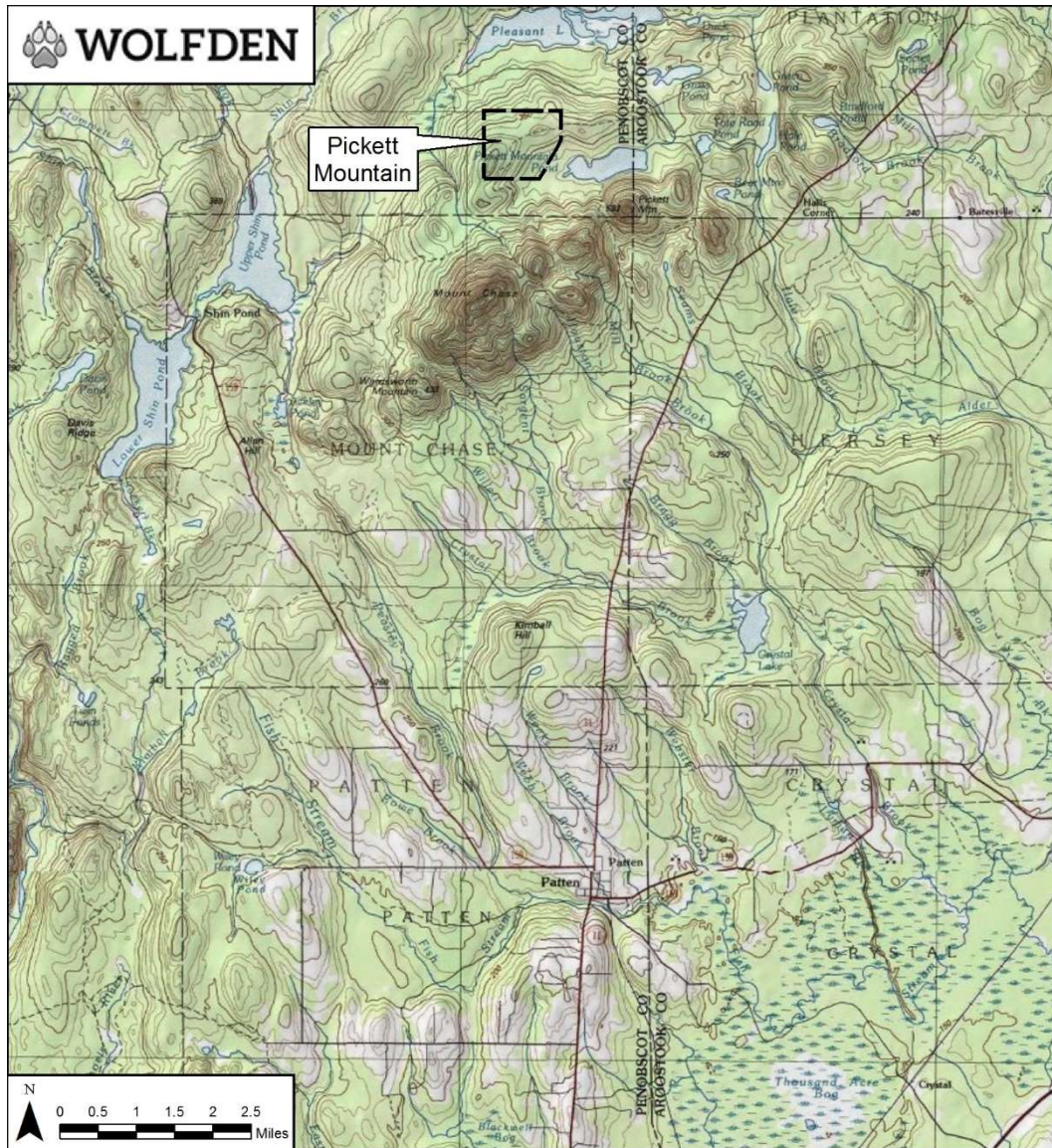
2.2 Project Overview

The following section provides a general overview of how mine and process waters will be managed. The strategy for mine development, processing of mineralized rock, and management of tailings is discussed. Each of these processes have a water management component. Additional Information is provided in Exhibit 10.

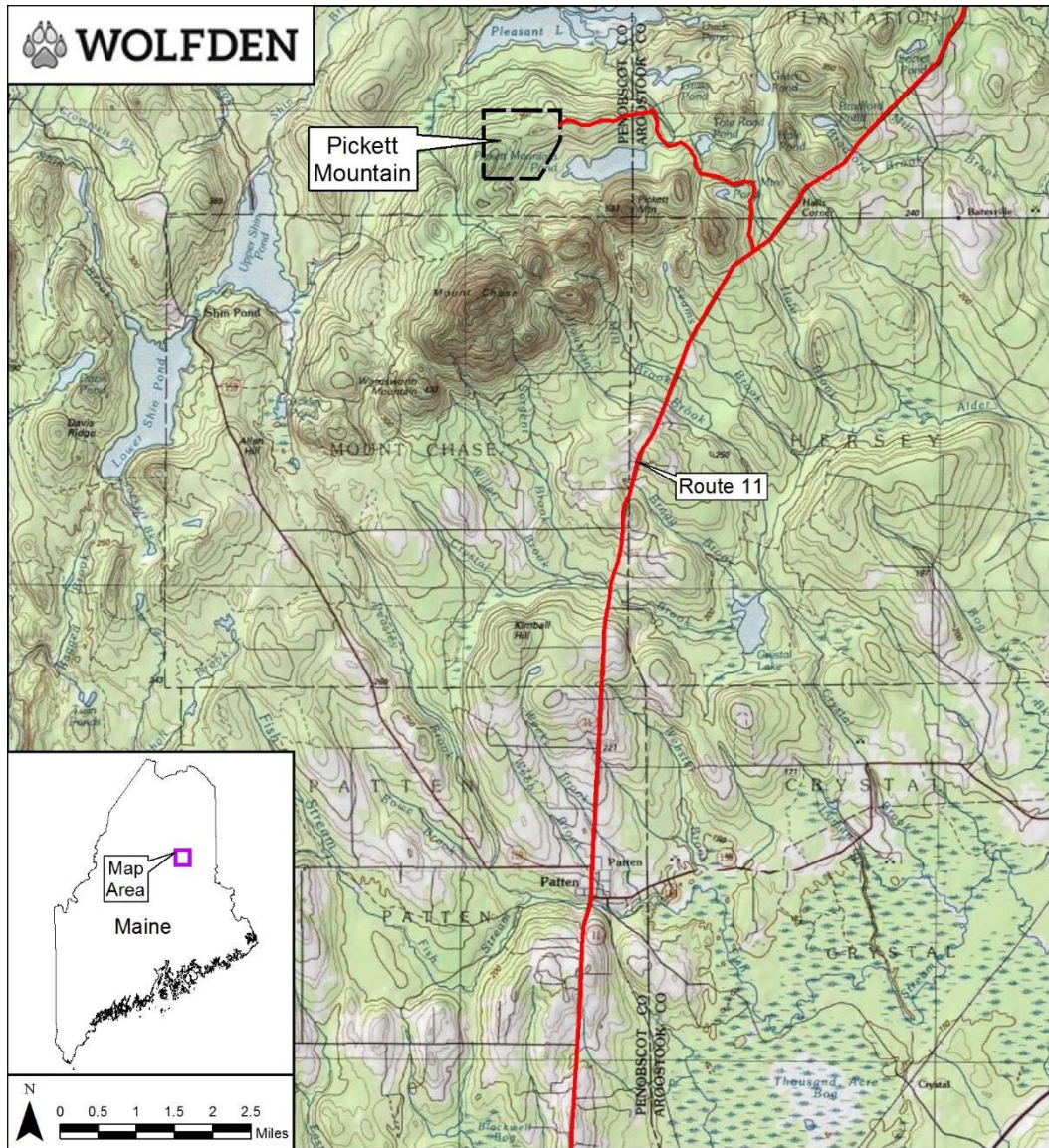
The proposed development includes construction of facilities necessary for development, operation and closure of an underground metallic mineral mine. Access to the mine operations area will be by existing gravel roads that will be subject to ongoing maintenance and improvements for safety. The area to be rezoned from a General Management (M-GN) to a Planned Development (D-PD) subdistrict encompasses approximately 646 acres, of which 45.9 acres will remain P-SL2 Shoreland subdistrict. Impervious area represents a total of 14.6% of the proposed footprint. Building structures represent an area of 2.3 acres, lined facilities represent an area of 70.8 acres, other impervious surfaces total 21 acres, for a total of 94.1 acres of impervious areas (including 50.5 acres for a lined and capped tailings facility). An additional 22.7 acres outside of the proposed rezone boundary is required for access road upgrades. The total impacted area within the proposed boundary for rezoning is 122 acres. The total impacted area including within the rezoned area and access road upgrades leading to the property is 144.7 acres. The total cleared area is estimated to be 158.6 acres and assumes 30% additional acres above and beyond the total impacted area, will be cleared to accommodate the development.

Wolfdon Mt. Chase LLC (Wolfdon) is requesting a subdistrict change to a 528.2-600.1-acre area of land that is currently within a General Management subdistrict in order to allow for construction, mining, milling, closure and reclamation activities to occur over an estimated duration of 10-15 years. -This specific area is required for subdistrict change due to the nature of mining operations.- The geological resource has been identified in this location and in order to safely, and responsibly extract the minerals, the project site is fixed. The design takes advantage of topographic relief in a manner that supports future closure of the property with little impact to the original landscape.

The project has been named Pickett Mountain and is located north of Patten bordering both Penobscot and Aroostook Counties as shown in the following location map.



Access to the project site is via an existing logging road. The road is constructed in a manner that is sufficient to support the concentrate truck fleet, as well as delivery logistics and employee traffic. The road width currently ranges between 12-15 feet based on Maine DOT "Lane Width and Shoulder Width—C1" dated November 10/2010, a minimum road width of a HCP 6 roadway with a speed limit of less than 40 mph is 11—12 feet with a 1-3 feet shoulder per lane for a total minimum of 22-24 feet with a 2-6 feet shoulder. In order to support safe travel of additional traffic, a road expansion of ~8-12 feet to ~24 feet is required over the total road length of 5.1 miles. In addition to the road way expansion, additional clearing of 10' on each side of the road way will take place in areas where visibility is constricted. Finally, 18 feet (inclusive of the 10' visibility clearing) of clearing will be completed along the one side of the access road to accommodate the over head power line. Discussed later in this report.



Site Access from Route 11 North of Patten Maine.

Pickett Mountain, is a high-grade polymetallic base metal deposit primarily composed of with economic minerals of interest that include Zinc, Lead, Copper, Silver and Gold as economic minerals of interest. Grades associated to Pickett Mountain are as follows:

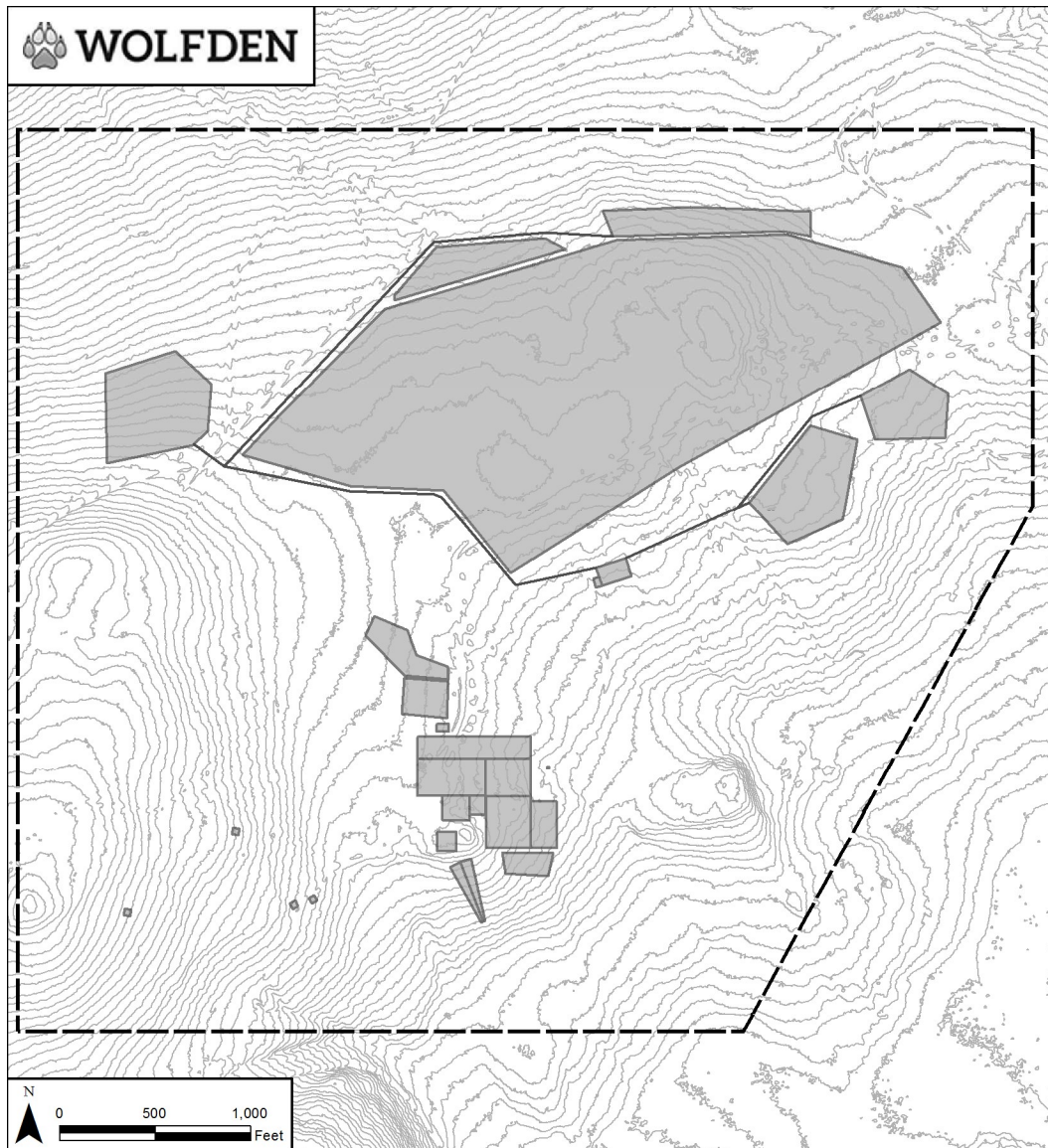
Table 1: Forecasted Metal Grades

Metal	Mined Grades
<u>Zinc (%)</u>	<u>8.56</u>
<u>Copper (%)</u>	<u>1.11</u>
<u>Lead (%)</u>	<u>3.40</u>
<u>Gold (g/t)</u>	<u>0.79</u>
<u>Silver (g/t)</u>	<u>88.80</u>

The intended process is to excavate the valuable in-situ minerals (ore) from underground via drilling and blasting into manageable sized fragments that can be loaded into underground trucks or into a skip (vertical material conveyance) and hauled or hoisted to surface to be stored on a temporary stockpile for milling (crushing and grinding to a fine dust/particulate) and concentrating. (separating the valuable minerals from the rock with no value). Ore sorting may occur under ground or at surface to separate any rocks that do not contain any minerals of value before the milling process. Milling and concentrating with will occur continuously at a nominal rate of ~~1000~~1200 metric tonnes per day (tpd). The concentrator will use flotation technology to separate the valuable minerals (to become concentrate) from the non-valuable minerals (to become tailings). Three separate mineral concentrates will be produced in sequence; copper, lead then zinc, with each dewatered and stored separately for transportation to a selected smelter outside the State of Maine. Transportation of mineral concentrates will be ~~facilitated~~accomplished using truck and trailer combinations with optimized capacity for the amount of mineral concentrate produced. ~~Waste~~The no-value finely ground rock byproduct (Tailings~~tailings~~) will be dewatered and ~~thickened~~(filter pressed) into a "tackydamp sand" consistency and delivered via trucks and ~~dozers~~bulldozer to an approved Tailings Management Facility (TMF) where they ~~can~~will be shaped, compacted and contoured. ~~Water from the~~ to match the topography. Up to 90% of the water, that is extracted by the filter presses while dewatering of the tailings and concentrates will be recirculated ~~in into~~ the processing plant. The TMF will be lined ~~in such a way as~~with impervious layers in accordance with MEDEP Metallic Mining Chapter 200 specifications and requirements to ensure that any residual decant water, precipitation, or other water introductions ~~will be collected and not allowed to come in contact with the water table below.~~ waters are collected and treated to background water quality levels before being diffused back into the groundwater via infiltration galleries. The total footprint of the TMF is expected to be approximately ~~78.4~~50.5 acres and will be built in 5 sequential sections sequentially over the life of the operation. Each section shall be ~~~15~~(or cell) will be approximately 10.1 acres and will be operated and then closed as the section opens ~~in order~~sequentially every 2 years, to limit the amount of tailings materials exposed to natural elements and progressively manage the TMF closure and reclamation process ~~on an ongoing basis and.~~ The active tailings cell will be covered with temporary tarps during material placement to minimize risks and exposure. ~~infiltration of precipitation.~~ The closure of each cell will include a cap constructed in accordance with MEDEP Metallic Mining Chapter 200 specifications and requirements and will include monitoring of groundwater and surface water. All water collected from the TMF will be ~~and~~ pumped back into the milling circuit described above along with some make up water. The milling process is expected to have a net negative additional water balance, such that some fresh ground. Any contact water will be required to keep the entire ~~that is not used in the milling and concentrating process working and none of these waters is~~ redirected to a Water Treatment Plant where it will be treated to background water quality prior to discharge into the ground via infiltration galleries. Similarly, water collected and pumped from other site collection points (e.g., lined pads) and the underground mine will be discharged to the environment. ~~treated to background water quality water quality prior to discharge back into the ground via infiltration galleries.~~

A series of ancillary activities will be required to support the project. —These include electrical generation/distribution, maintenance/mechanical support, fuel and explosive storage, security, water management and treatment, warehousing and procurement, accounting, human resources management, health and safety management, environmental management and community relations. —All ancillary activities will occur on the project site. ~~The conceptual location of each~~ A Preliminary Site Plan and Facility Layout of these activities ~~is elements are shown in the following~~ on **Figure 2-1 (Exhibit 2 - Attachment A)**. A more detailed figure. The building designations, including their functions and approximate sizes and type stable of the Preliminary Site Plan and development plan components are identified located in **Exhibit**

D-2-7. The tallest structure on the project site will be the ~~concentrator~~headframe building at an estimated 6080 feet tall.



Conceptual Location of Buildings and Facilities

The project will also, ~~separate from this Petition, establish~~ require a new power transmission service line to supply ~~the additional needed electrical power~~ required for the project.

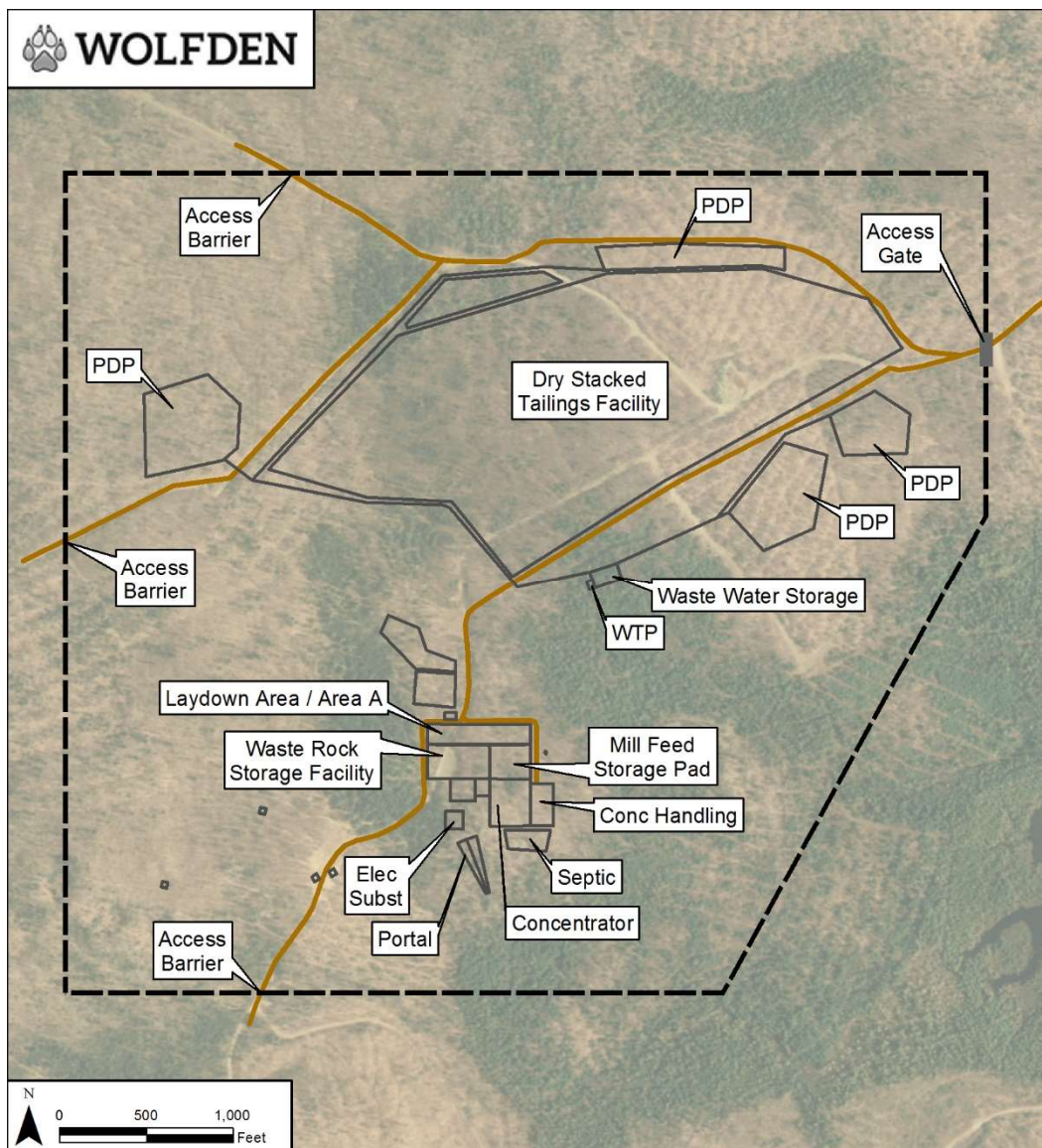
The power transmission route has been ~~discussed with~~ planned by Versant Power (previously Emera Maine) and would run from their substation located on Route 11, located approximately 0.6 miles south of downtown Patten, Maine. -The transmission line would run north and northeast along Route 11 for approximately 9.5 miles then follow the same gravel access road proposed for the mine for approximately 5.1 miles. -The corridor width for the power transmission route is considered in the forecasted road width and is 18 feet in addition to the shoulder of the proposed expanded roadway. -Main transmission powerlines will be managed by ~~Emera~~Versant Power to a termination point at the main substation on the property.

The main site power infrastructure will be managed by employees and contractors hired by the company. The estimated footprint of the main substation area is 10,000,586 square feet ~~and it is identified on the following map west of the~~. All high voltage electrical infrastructure will be fenced in or otherwise enclosed to ensure access road is restricted to only trained employees.

Access to the property will be managed by a series of fixed barricades at each road access to the property as well as a stationed security facility and traffic gate at the east boundary of the re-zoned property as shown in the ~~following image~~. **Figure 2-1.** "Danger" and "No Unauthorized Entry" signs will be posted around the perimeter of the property boundary within visual distance of any point of the boundary. -The boundary will not be fenced at any point of the project life. -Security will be hired through contract for 24 hour per day, 7 daydays per week coverage. -Within the property, the explosives ~~are~~will be stored in locked facilities with regular logging of activity and management of supply. -Once the mine has been ~~developed~~ substantially developed, the explosives ~~are then~~will be stored in an excavation and powder magazine specifically designed to contain explosives and managed by specifically assigned employees. ~~Explosives~~All explosives will be managed as per federal and state regulations at all times.

~~All high voltage electrical infrastructure is fenced in or otherwise enclosed to ensure access is restricted to trained employees only.~~

Signage throughout the site will be posted to notify all people of any access requirements such as personal protective equipment, potential hazards and training.



Security and Fixed Barrier Locations

The life of the project can be broken down into four phases: Permitting, Construction, Production and Reclamation/Remediation. Each of these phases will occur sequentially however the latter three phases will also overlap to ensure a smooth transitions, including concurrent and monitored transition of the reclamation and remediation, as described below.

2.1.12.2.1 Phase 1 – Permitting:

The permitting steps for this project under chapters 10, 12 and 13 of the LUPC's rules and DEP's Chapter 200 rules are as follows:

- Rezoning for appropriate land use.

The land that the Picket Mountain deposit is located on is currently zoned as General Management subdistrict (M-GN). For construction, operating and rehabilitation work to take place, it must be rezoned to a Planned Development subdistrict (P-~~DPD~~-PD) which allows for large-scale well-planned development work outside of standard development. The process of rezoning that depends on a particular natural feature or location that is to:present at the site.

- ~~Establish a conceptual project plan.~~
- ~~Submit a rezoning petition outlining the details and potential impacts of the plan.~~
- ~~Confer with the LUPC and public identifying all opportunities and risks and mitigation plans to address risks.~~
- ~~Receive the LUPC's approval of the rezoning petition.~~

Once the land has been rezoned for project development, there is a comprehensive (minimum 2 year) process for obtaining a mining permit application may be submitted to from the DEP. -The following steps would be taken as part of submitting a mining permit application for approval applications process includes the following:

- ~~Design of the baseline study work for environmental~~ Preparation of the Baseline Characterization Study Work Plan to evaluate soil, groundwater, surface water, sediment, biological, and conditions as well as well as archeological status, and other environmental of the property.
- Review and approval of the ~~baseline work~~ Baseline Characterization Study Work Plan with the DEP.
- Complete baseline study work ~~for environmental, biological, and archeological status of the property.~~
- Submit the baseline study results as well as to the DEP
- Prepare and submit detailed design plans for construction, operation, and reclamation plans for the life of the project including the project outcomes such as economics and anticipated impacts on the environment, population, economy, infrastructure, etc.
- Receive DEP's ~~conditional~~ approval of the mining permit application.

2.1.22.2.2 Phase 2 - Construction:

Upon completion and approval of the mining permit application, the project may move forward to construction. -Construction of the Pickett Mountain Mine ~~project~~ will include the following activities (not necessarily in this order):

- Installation of ground and surface water monitoring locations.
- Removal of trees and grub the land to be used, will happen throughout the construction on an as needed basis, to ensure no over stripping of land.
- Construction of roadways to various locations at site.
- Construction of mineralized and waste rock pads.
- Installation of temporary explosives magazines (Rental from supplier).
- ~~Installation of ground and surface water monitoring locations.~~
- Installation of air monitoring systems.
- Construction of the water management ponds and discharge structures.
- Construction of the water treatment plant facility.

- Construction of temporary shop facility.
- Excavation of the mine portal and installation of temporary mining services (compressed air, power generation, ventilation, process water).
- Commence mining development.
- Excavation of ventilation raise to surface.
- Installation of potable water system.
- Installation of security infrastructure.
- Installation of mine offices and dry facility (Change house).
- Installation of warehouse and laydown area.
- Installation of electrical substation
- Tie in electrical infrastructure to newly installed grid (Completed by others)
- Construction of TMF stage 1.
- Construction of concentrator and supporting facilities.
- Construction of permanent shop facility.

~~Grubbed material will be managed on-site. Most of the timber and stumps are small, and to the extent timber removed has limited or no economic value, it will be chipped on site for use as erosion control materials, including stumpage. Stumps too large for chipping will be stored with the organic topsoils in a pen less than one acre and allowed to decompose until used at the end of the project during reclamation.~~

~~Waste materials during construction such as excess concrete are sent back to the supplier for proper management.~~

Construction will typically utilize as much local, or state skill sets as possible, and the majority of material used during construction will be sourced locally or within the State of Maine. -Specialty skillsets, services, and materials will be sourced externally as required and are expected to include such items as the flotation and ball mill equipment and services within the concentrator, as well as initial or contract mining services. -As programs advance through construction, skillsets will be built and trained locally to ~~continuously~~ convert external services to in-state or near project services.

Potable water for constructed facilities will be supplied via drilled well and storage tank within a small potable water facility contained within the footprint of the office complex. Potable water will be used for hand washing, showers, and washrooms but not for drinking purposes. Drinking water, will be imported to site in large containers used to supply water coolers.

The following Figures were developed as part of the conceptual design and layout of the proposed facilities. These figures provide detailed information on the facilities proposed and can be found in **Exhibit 2 - Attachment A.**

- **Figure 2-2 (Preferred Alt 3)-Proposed Grading Plan** consisting on rough grading of significant mine facilities for the site to better define quantities, drainage patterns and water collection areas to be piped to water storage ponds
- **Figure 2-3 (Preferred Alt 3)-Proposed Grading and Cross Sections** consists of grading and cross section at major mine facilities that will be shown on cross section **Figures 2-4 & 2-5.** This

will be used to show how proposed grading has been developed to eliminate ledge excavation and utilize fill for the site

- **Figure 2-4/5 (Preferred Alt 3)-Cross Sections** showing cross section depicted on **Figure 2-3**
- **Figure 2-6 (Preferred Alt 3)-Details** consisting of proposed site details for typical access road build up, infiltration gallery design, lined pad and pond systems, and erosion control measures that would be applied for full design plans

2.1.32.2.3 Phase 3 – Operation:

As the site is constructed and the concentrator facilities are finalized, development of underground workings will continue to take place. ~~Waste rock~~Rock of no commercial value, either sorted or excavated from the mine, will be deposited and stored on ~~the~~a lined surface pad and ~~the~~mineralized material~~ore~~ will be stored on the mill feed pad. These storage pads will have impervious liners with drainage layers designed to collect leachate and sumps to collect run-off and will be built to the DEP Metallic Mining regulations and specifications. Water collected from the lined pads will be pumped to the Water Treatment Plant for treatment to background water quality prior to discharge via infiltration galleries. The mineralized ore will be stockpiled on the pad and used during the commissioning of the concentrator. ~~Upon completion of commissioning of the concentrator, regular operations of mining, crushing, concentration, tailings management and shipping~~transportation/sales will commence.— During this phase of steady-state operations, significant and continuous training to upskill a local workforce is anticipated related to the mining, processing and support services which are currently estimated to last 8–~~9~~10–15 years.– Programs in training and education will occur to facilitate a working pool of employees to ensure stability of the operation support of the local workforce.

All activities will occur continuously during the operation phase in order to explore, develop, extract, concentrate and sell minerals from the project. ~~As the project nears final completion, activities will stop sequentially.~~

Snow removal during operations of the project will take place during heavy snow winter operations. Snow from roads and un-impacted areas will be pushed away from the areas to their outer boundaries. Clearing has been considered in the preliminary site plan to ensure there is room for snow storage. Snow removed from impacted areas, will be placed within its respective area. For example, snow removal from the tailing's facility will remain within the tailing's facility. In spring when melt takes place, water will be collected in the respective collection ponds/sumps and pumped according to the site water management.

2.2.3.1 Exploration

Exploration will continue during the operation phase of the project with the intent to define additional reserves for mining and processing through the operation. ~~Activities included in exploration are as follows:~~

- ~~Diamond Drilling~~
- Exploration Geology, Geophysics, Mapping, Soil Sampling, Trenching
- Diamond Drilling, Core Logging, Core Sampling, Assaying
- Geotechnical Drilling and Logging
- Geological Modelling and Reserve Estimation

2.2.3.2 Mine Development

Development activities will occur to provide access and service drifts (tunnels) from surface to the deposit. ~~If A shaft from surface will be utilized to access deeper extensions (down to 2900 ft) of the ore deposit areas well as any additional ore that is discovered during the mining process, a shaft from surface may be necessary to access and haul ore from these deeper areas.~~ Various types of underground workings include:

- A portal (opening at surface) for the commencement of a ramp (decline) will be used from surface to access the underground workings and act as a haulage route for manpower, materials, rock and ventilation.
- Vertical shaft for conveyance of material and supplies.
- Lateral drifts on each working level connect the ramp to the deposit underground.
- Ventilation raises are near vertical tunnels that are used to provide clean air or exhaust to and from all of the drifts and ramps in order to provide workers with a clean air environment.
- Auxiliary raises/drifts are tunnels used to carry services such as compressed air, process water, dewatering, electrical, secondary and escape routes for the mine.
- Underground infrastructure with short termination (dead-end drifts) ~~include~~includes, refuge stations, water collection sumps and pumping stations, electrical distribution substations, material storage areas, remucks (Rock storage areas), ore sorting or underground crushing, explosives storages, and washroom facilities.

~~Activities used for~~Some examples of various underground infrastructure are included in the following figures:

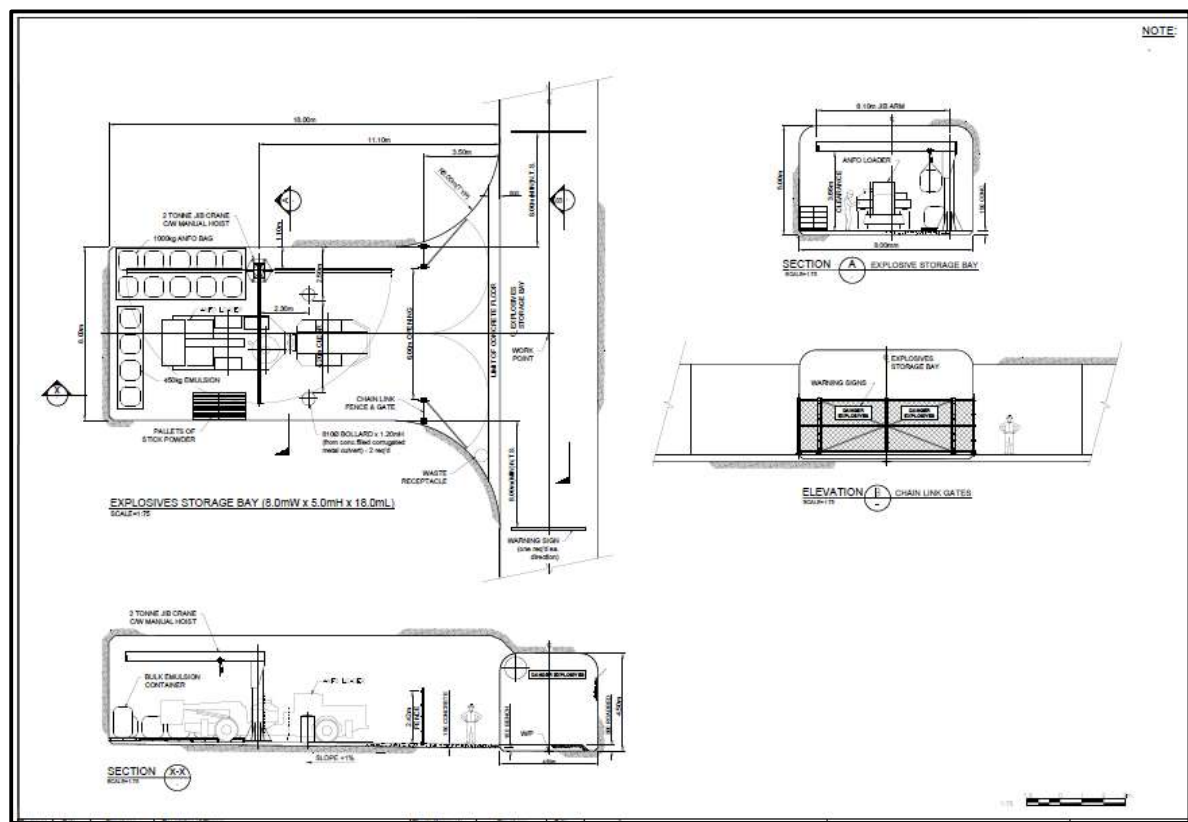


Figure 2-7: Underground Explosives Storage Detail

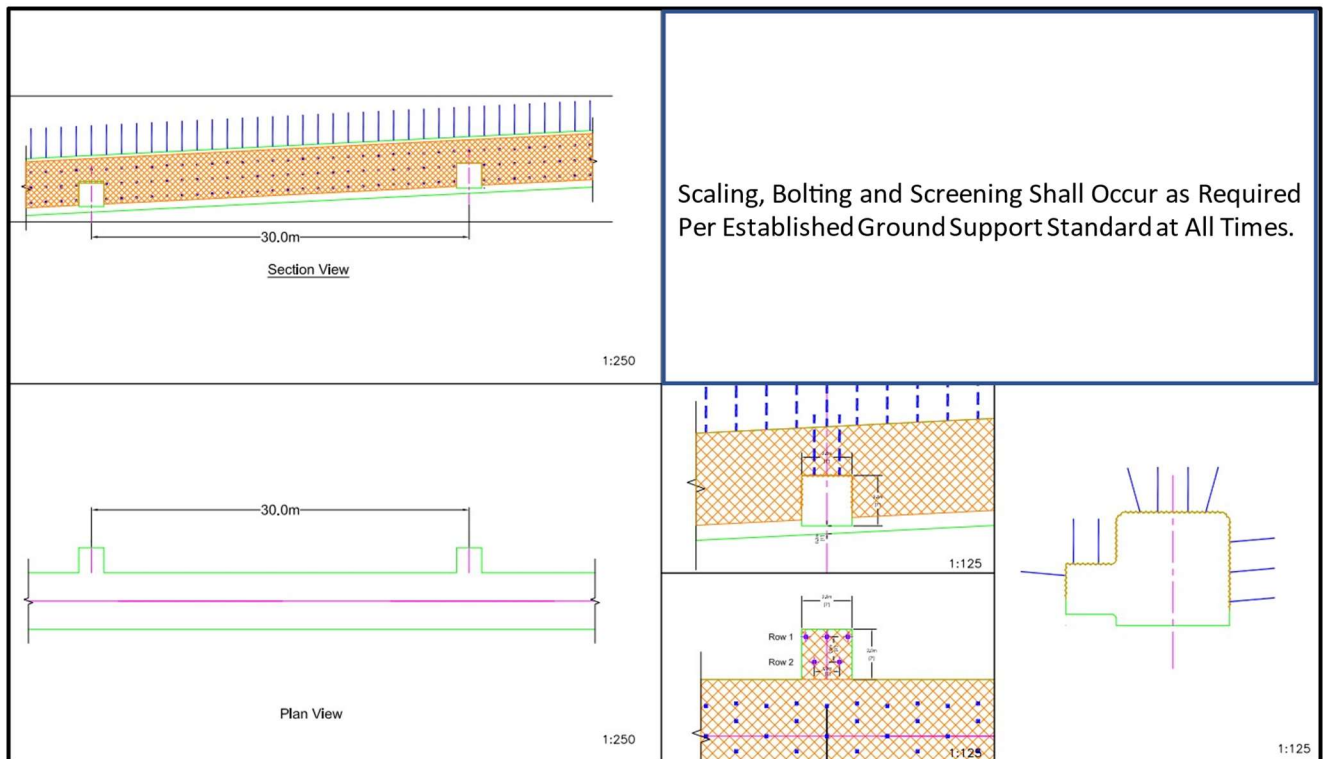


Figure 2-8: Underground Safety Bay Detail

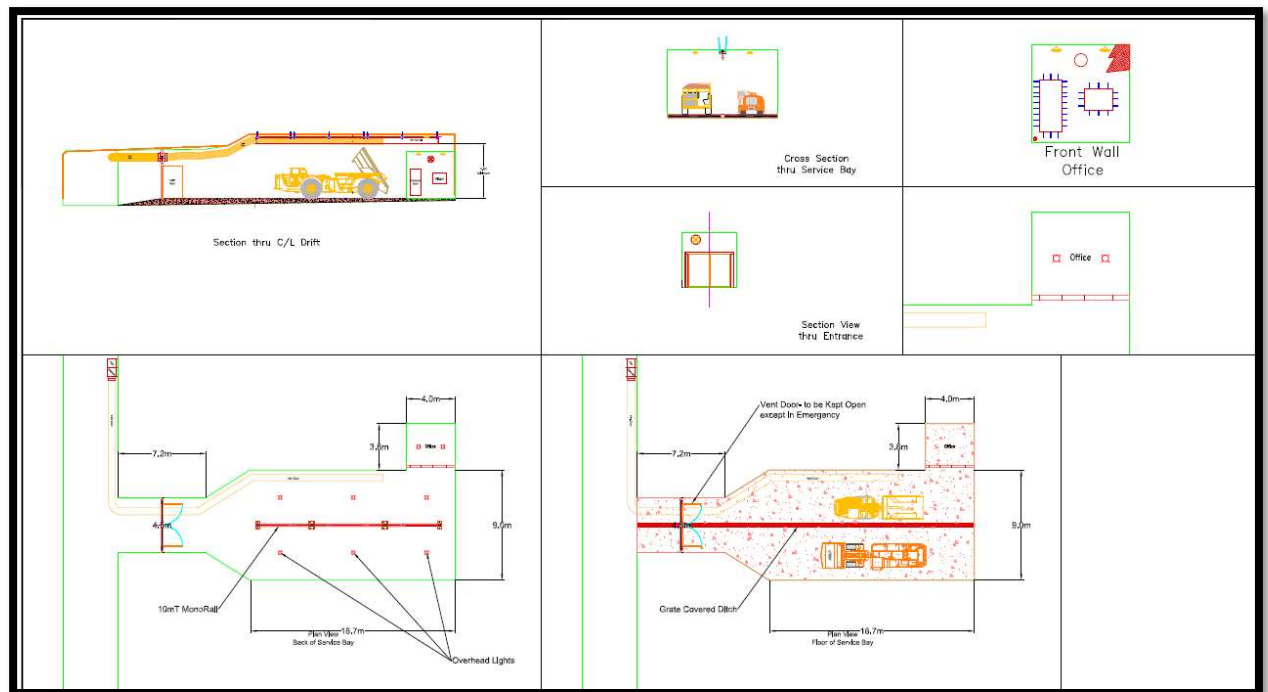


Figure 2-9: Underground Shop/Service Bay Detail

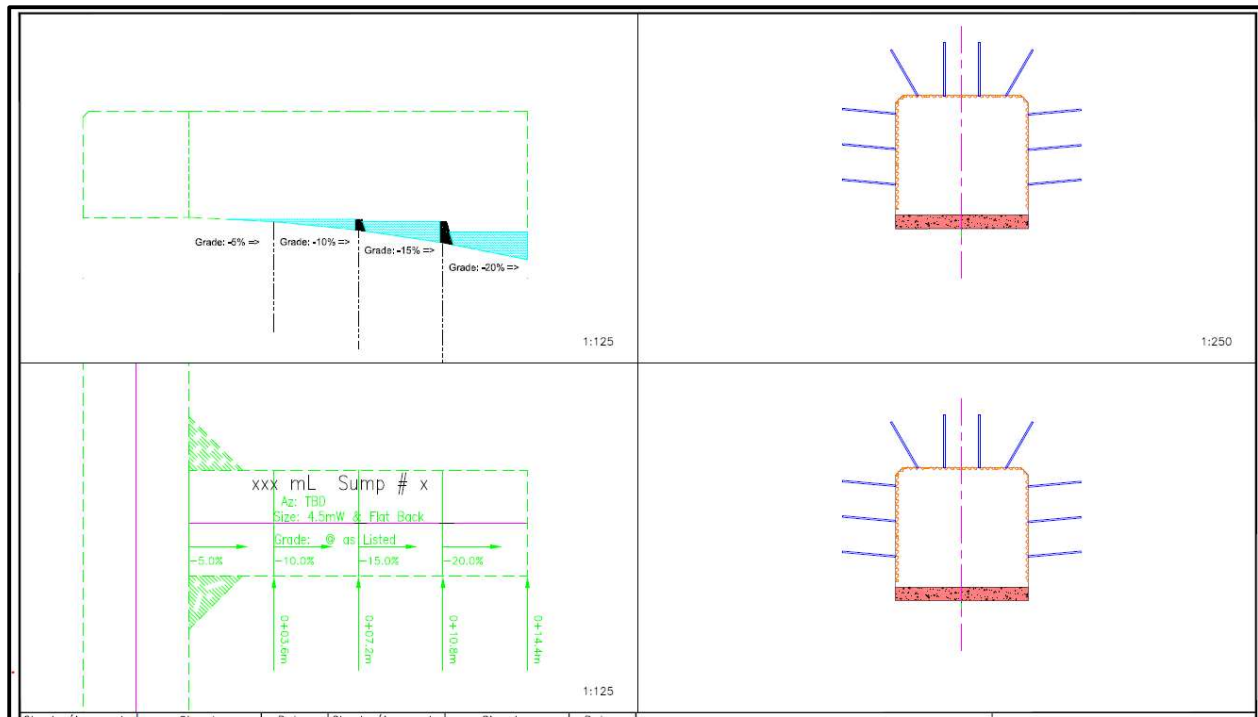


Figure 2-10: Underground Sump Details (Clean and Dirty Water Sumps)

Underground development activities will include:

- Horizontal development drilling is typically completed using a hydraulic jumbo drill (carrier mounted drills) and an operator in the larger drifts. -Small drifts may be mined by jackleg.
- Vertical or inclined openings may be mined by a jackleg, stoper or wagon drill.
- ~~Blasting is performed using hand-held pneumatic loaders or by hand loading emulsions sticks into the drilled holes.~~ Blasting occurs, typically two to three times per day once everyone is confirmed out of the mine. Loading for blasting is performed using hand-held pneumatic loaders, by hand loading emulsions sticks into the drill holes or by an employee operated explosives loading unit.
- Mucking is a term to describe the removal of the rock (~~ore or waste~~) from a development heading typically with a scoop tram (Low-low-profile front-end loader). -The rock is placed into a low-profile truck for haulage to surface, shaft or remuck location for further handling.
- Haulage is completed using underground low-profile haul-trucks that are loaded by the scoop trams. -The trucks are used for hauling rock (~~ore and waste~~) out of the mine as well as hauling ~~waste~~ rock and cement back into the mine during the backfilling phase.
- Ground support such bolts, screen/mesh and rebar are typically used as required to ensure rock stability of the walls and roof of the underground workings in order to ensure safety for all workers throughout the project life. -This is completed according to an engineering procedure and planning and varies based on type of rock, locations, duration of opening, etc. -The tasks included in ground support are drilling holes, installing a steel mesh screen over the rock face and securing it in place using various tendons or "rock bolts".
- In addition to ground support, other underground construction may include cement work, timber work, steel work, plumbing, electrical work, amongst others, in order to provide necessary services and improve safety.

- Sump management includes the collection of mine process water (used for drilling) and groundwater seepage into a series of sumps throughout the mine. The water is retained in the sumps to allow for suspended solids to settle out and allow for water to be clarified. The clarified water is then pumped out of the mine for water treatment and recycling or discharge into the infiltration galleries. Slimes (settled rock solids generally consisting of fine grain drill cuttings) are managed periodically by draining the water from the sump and allowing the slimes to dry out for handling with a scoop tram. A scoop tram then removes the slimes from the sump and deposits them into active backfill areas for blending with waste rock fill.

Typically, non-mineralized rock outside of the Pickett Mountain deposit (rock excavated during development) is non-acid generating and in fact carries significant neutralizing potential. This is identified by the lab test work shown below. Seven samples were selected, spatially distributed for the static testing and are listed in the following table. Each of the samples were dried, crushed to 80 % passing 5 mm and split into sub-samples for acid base accounting (ABA), multi-element assay and sulfur and carbon speciation analyses. The **Research Productivity Council (RPC) Report** is provided in **Exhibit 2 – Attachment B**.

Table 2: Pickett Mountain Acid Base Accounting Samples

Wolfden Samples Received

Sample ID	Mass (kg)
ABA - 001	2.10
ABA - 002	2.95
ABA - 003	2.20
ABA - 004	2.30
ABA - 005	2.25
ABA - 006	2.85
ABA - 007	2.90

The following table shows the results for each of the samples selected and tested. Results from the lab analysis shows that 4 of 7 samples were Non-Acid Generating and the remaining 3 of 7 were Potentially Acid Generating.

Table 3: Pickett Mountain Acid Base Accounting Results
Acid Base Accounting Results on Wolfden Samples

Sample ID	Paste pH	Total Sulfur	Sulfate [†] (as S)	Sulfide	Carbon Total Inorganic	Carbon Total	Acid Production Potential	Neutralizing Potential pH 8.3	Net NP pH 8.3	NP/AP
		%	%	%	%	%	Kg CaCO ₃ /tonne			
ABA-001	9.5	0.124	0.009	0.114	0.15	0.21	3.8	17.4	13.6	4.6
ABA-002	9.4	0.021	0.005	0.016	< 0.01	< 0.01	0.5	5.5	5.0	11.0
ABA-003	8.3	2.70	0.008	2.69	< 0.01	< 0.01	84.1	1.7	-82.4	0.0
ABA-004	9.7	0.262	0.002	0.260	< 0.01	0.02	8.1	3.7	-4.4	0.5
ABA-005	9.7	0.085	0.002	0.083	0.05	0.07	2.6	8.5	5.9	3.3
ABA-006	8.9	0.926	0.003	0.923	0.05	0.08	28.8	7.7	-21.2	0.3
ABA-007	9.3	0.005	0.003	0.002	0.01	0.04	0.1	8.2	8.1	131

[†] Acid soluble, non-volatile sulfur species (sulfate (as S)).

Sulfide was determined as the difference between Total Sulfur and Sulfate (as S).

The locations of each of these samples are as shown in the following plan and cross sections.

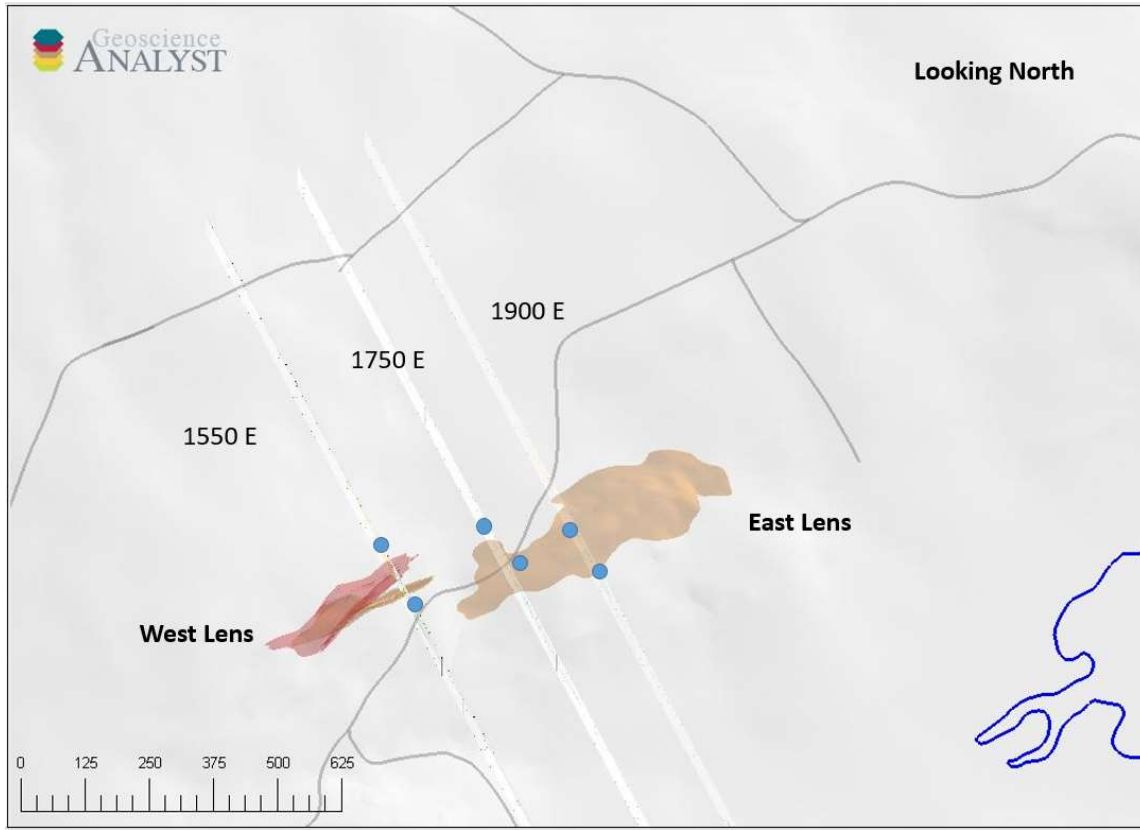


Figure 2-11: Map Showing Section Locations for ABA Analysis.

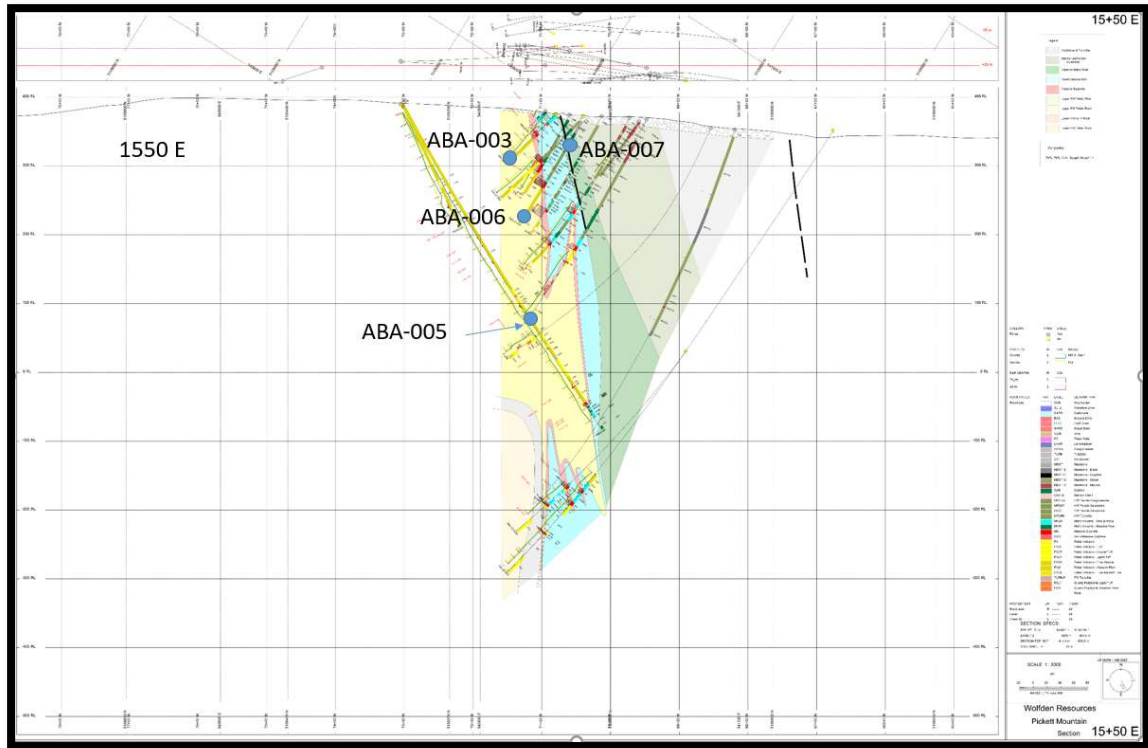


Figure 2-12: Section 1550 E Identifying Acid Base Accounting Sample Locations

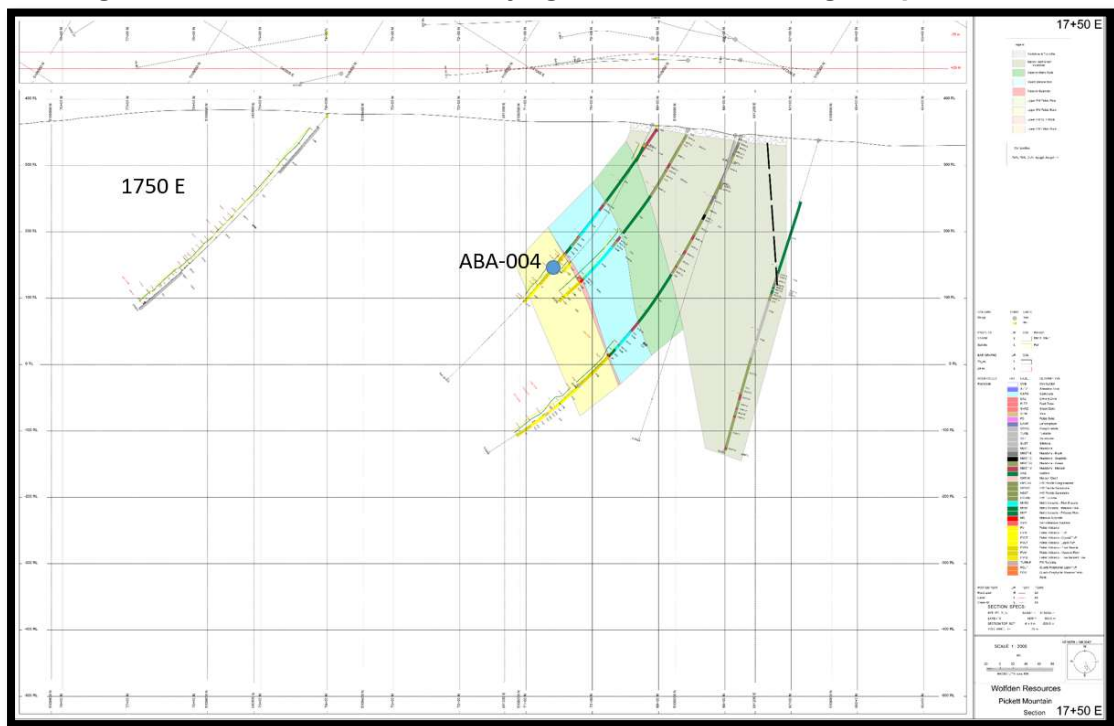


Figure 2-13: Section 1750 E Identifying Acid Base Accounting Sample Locations

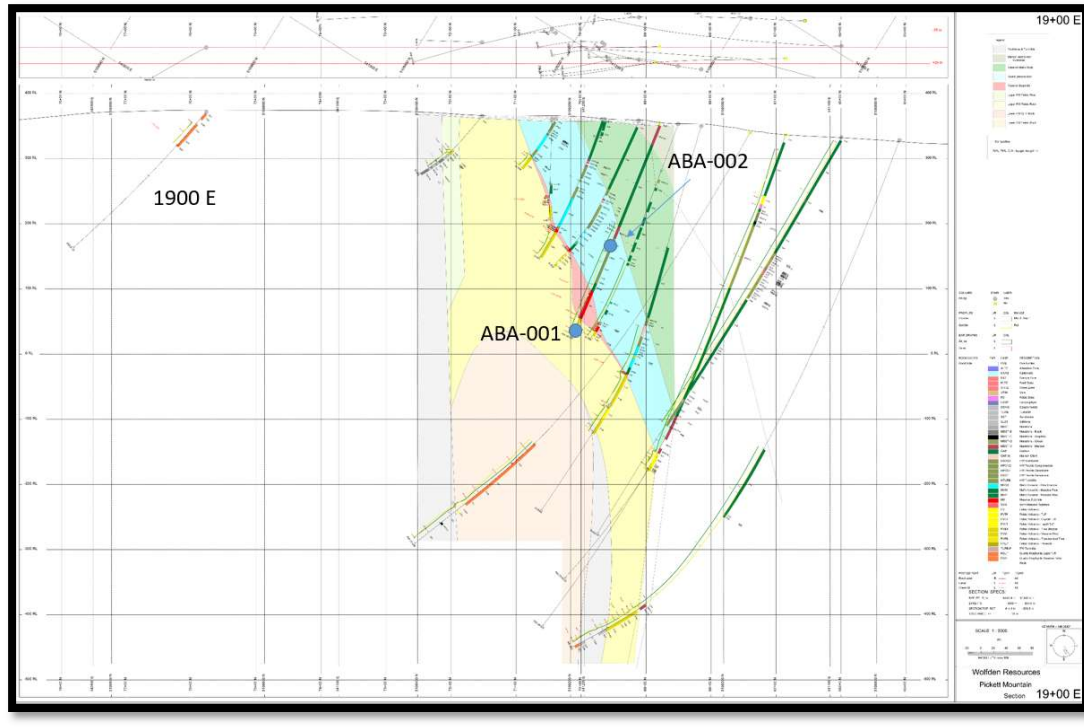


Figure 2-14: Section 1900 E Identifying Acid Base Accounting Sample Locations

As identified in the figures and table above, the samples that generated “Potential Acid Generating” results, are the samples nearest the mineralized deposit (Shown in red). All samples greater than approximately 100 feet away from the deposit had “Non-Acid Generating” results. The majority of infrastructure and mine development is planned further than 100’ from the deposit for geotechnical considerations and will significantly reduce the potential of acid generation in the contact waters.

In addition, after rock is deposited underground as backfill, it is in a low oxygen environment and therefore will not react with ground water even if portions of the rock do contain acid generating potential.

Seepage of bedrock water as well as the use of water during the mining process, necessitates constant mine dewatering. Although engineering/hydrologic studies have not been conducted to quantify flow rates required to keep the working areas of the mine in a dewatered state, it is currently estimated based on similar site experience and the likelihood of low transmissivity bedrock at depth, that these “seepage” flows are likely to be on the order of 30 gallons per minute (gpm) long term.

Initial dewatering is usually conducted through use of bedrock extraction wells (dewatering wells) to reduce the bedrock potentiometric surface prior to and during development of the decline. This water will be used for storage and recycled for underground drilling. As underground workings are advanced, ground water seepage into these openings will occur, and that seepage will be pumped out eventually replacing the dewatering wells and establishing a network of water conveyance pipes within the developing mine infrastructure. During mine operation, ground water seepage will continue to be collected underground through a series of temporary sumps and pumps and treated on surface at the water treatment facility prior to being re-used for underground process water with any excess treated water returned to the environment via the water infiltration process. Waters used underground for drilling and wetting down rock surfaces to eliminate dust when mucking rock will be pumped through a connected network of pipes that can be modified and extended as the underground workings are developed.

When mineralized rock is mined and processed, the surface area of exposed sulfide mineral increases along with the potential for acid generation. Exposure of these sulfide minerals to oxygen and water results in weathering and oxidation producing acidity (hydrogen ions), dissolved sulfate, dissolved metals and soluble acid-sulfate minerals. Undisturbed sulfide mineral deposits have limited exposed surfaces, and therefore pose little threat to groundwater under natural, oxygen-limited conditions. Since this weathering process requires presence of both oxygen and water, as well as time, effective strategies to prevent acid generation are incorporated into the design and operation of the mine. In the short term, these strategies rely on limiting exposure of these materials to water in the presence of oxygen as well as water collection and treatment. In the long term, strategies rely on isolating materials from water (infiltration), intrusion of atmospheric oxygen.

Any rock mined of no value will be segregated from the mill feed, temporarily stored on a pad on surface and then returned underground as backfill on an on-going basis. This manages and mitigates potential leaching and environmental impacts from this rock material.

2.2.3.3 Production

The strategy for mine production is to conduct underground mining using a long hole stoping and alimak mining methods with a decline and shaft to an estimated depth of 2900 ft, to allow underground haulage trucks and a hoist to carry mineralize rock (mill feed or ore) to a surface staging pad, where mined rock will be segregated from mineralize rock. The rock of no value will be stored on a pad until it can be returned underground for backfill. Rock that is placed underground as backfill is not treated or neutralized, rather is simply placed as broken rock with or without the addition of cement to add strength.

Extraction/production activities will be continuous and repetitive compared to other activities that take place in the mine. -Once various production areas in the mine are prepared, production miners will take over and accomplish the following activities in order to ~~provide ~1000~~remove ~1200 tonnes per day of ore ~~mill feed~~ material to surface:

- Production (blast hole) drilling at Pickett Mountain will comprise near vertical holes on rings within a production area or panel (stope). -These rings are drilled in a distributed grid to effectively distribute explosives throughout the panel for optimized fragmentation of the rocks.
- Blasting practices are similar in process to development but on a larger scale and in vertical holes vs horizontal holes. -These activities are typical performed by hand including the loading of explosives into the drilled blast holes.
- Mucking is similar to the development activity.- However, mucking for production is sometimes done via remote control in order to reduce the risk of injury to the operator.
- Haulage of ore is similar to the haulage of all blasted rock from development-~~rock~~ activity.
- Backfilling occurs after a production area has been fully excavated and there is a significant void left behind to be filled. Backfilling typically uses a scoop tram to dump rock fill back into the void that had been previously sorted or hauled to surface during the development phase. In the case of Pickett Mountain, the voids created via drilling, blasting and removal of the rock can be back filled with half of the amount of material that was removed (1 tonne of blasted rock can typically fill the void space where 2 tonnes was removed). 46% of backfill required to fill underground voids will need to be brought in from an off-site source. Sargent Corporation has reviewed the requirement for off-site material to use as backfill and has provided estimated pricing of \$10.30 per tonne from a conceptual borrow source identified in their proposal (**Exhibit 2 - Attachment B - Sargent Quarry Proposal**). Since the material would be generated near the project site, no additional impact to traffic is expected. In addition, off-site material would be stored near the

mine opening on the mill feed storage pad but could be stored in smaller quantities sufficient for 24hrs of operations to reduce the required footprint. Larger campaigns of rock storage would not be required until after all of the development rock has been returned to underground from its temporary surface storage. The temporary storage facility could then be used to store rock material from off-site quarry sources. The cost of quarried backfill material is included in the economic justification discussed in **Exhibit 13** of this petition. The suggested potential source of this material is outside of the proposed rezone boundary and can be accomplished in a footprint of under 5 acres. Other sources onsite and offsite were evaluated in comparison and there is no intention of developing an onsite rock quarry for borrow material at Pickett Mountain. While excavating specific portions of the Pickett deposit, the sequence of mining each stope may result in one stope adjacent to another (primary and secondary stopes). In these circumstances, the addition of cement, for improved strength, will be added to create a consolidated cemented rock fill (CRF). An onsite backfill plant will be used to generate the CRF. This plant is a simple batch mixing plant where type 10 Portland cement, is mixed in bulk with a small amount of water and then blended with rock fill used for backfilling. When batches are complete, they are transported underground and dumped into stope voids that required CRF via low profile scoop tram. The following image shows typical locations of relative primary and secondary stopes in a long hole mining layout. Primary stopes are backfilled with cemented rockfill (CRF) to allow for stable excavation of the secondary stopes which are backfilled with unconsolidated rock fill.

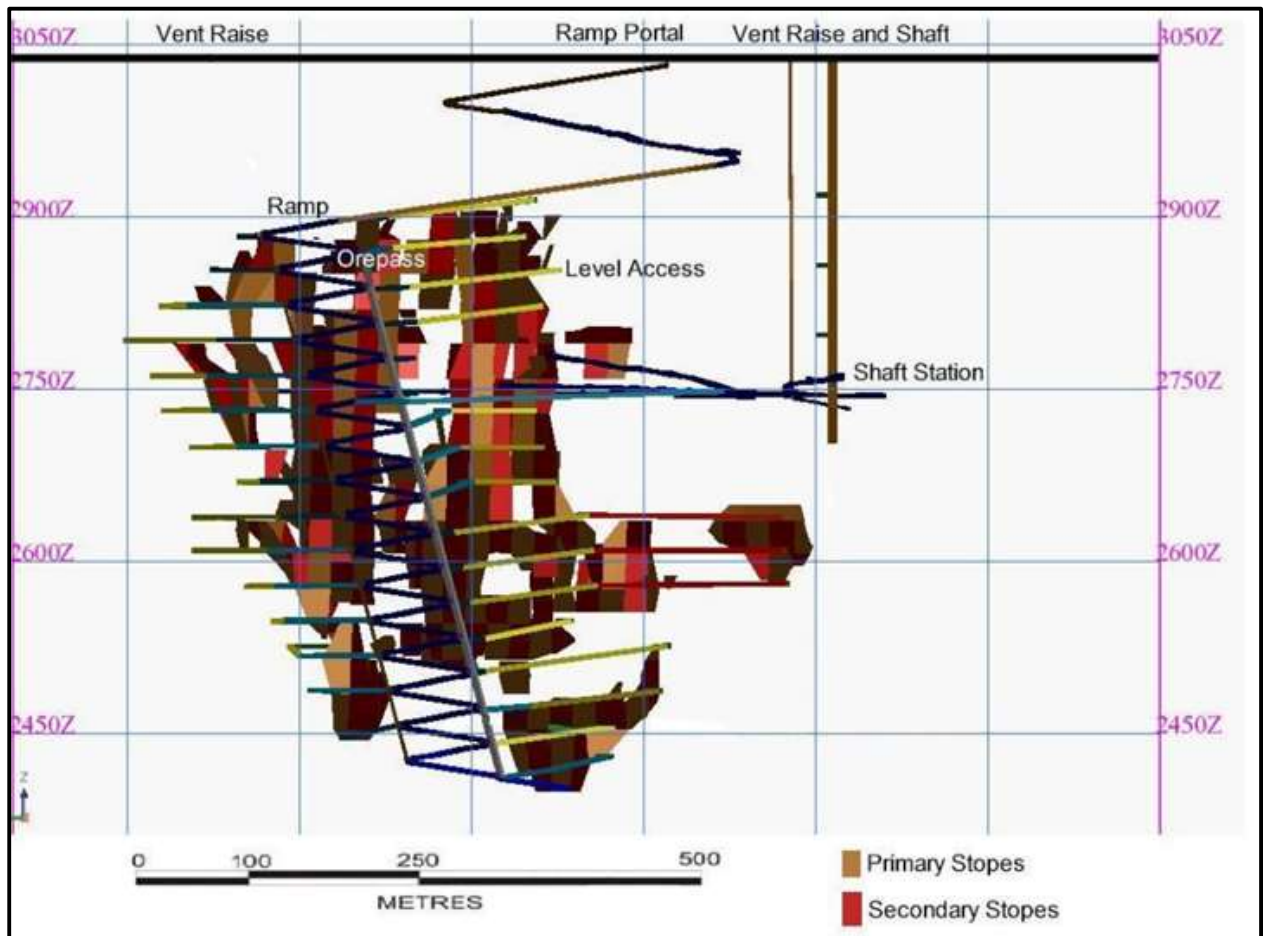


Figure 2-15: Primary/Secondary Stope Layout

A typical sequence of production stoping is shown in the following figure.

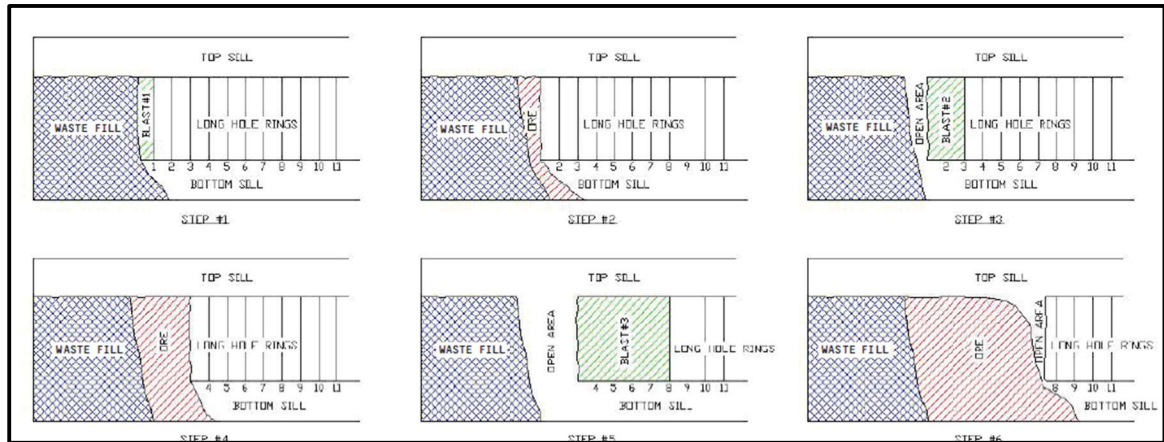


Figure 2-16: Underground Mining Production Sequence

- ~~Milling Backfilling is complete after a production area has been completed and there is a significant void left behind to be filled. Backfilling can occur using a scoop tram dumping waste material back into the void. This material is typically waste rock that has been hauled to surface during the development phase.~~

2.2.3.4 /Concentration

~~Concentration of ore mill feed takes place on surface via~~ the concentrator facilities ~~and is described in detail in another section of this Petition. building located near the mine opening. This location is ideal to~~ minimized material handling requirements of the mined material. The activities that will occur within the concentrator to separate the valuable minerals from the non-valuable minerals will include the following:

- Comminution is the act of crushing and grinding the ore mill feed material to a fine powder.- The grain size of the powder is specifically targeted to liberate or expose the valuable minerals within the rock with the least amount of grinding and energy.
- Flotation is a process that involves mixing several reagents (surfactants) with the ground rock in a series of ~~baths then~~ tanks while injecting air bubbles. -The ~~chemicals causes~~ surfactants selectively allow the valuable minerals to selectively attach to the bubbles. ~~The bubbles then, float to the top of the bath tank and overflow producing then flow over into a catchment to produce a mineral concentrate. The materials that are not selectively~~ The remainder of the ground rock sinks to the bottom of the tank where it is extracted and moved on to the next tank where a different mineral is floated (~~sank in the bath~~) are collected, ~~cleaned off~~ until all three minerals that holder either copper, lead and zinc have been extracted into three separate concentrates. After the final tank, the remaining ground rock, with the minerals removed, is extracted, dewatered by up to 90% (pressure filtered) and sent as tailings (in the form of damp sand) to the TMF.
- Reagent mix is completed in advance to ensure that various surfactants and chemicals within the process are prepared and delivered when and where designed.

- ~~Each of the products generated from the flotation process are thickened to a thick paste then dried to a predetermined specification. This is typically performed by a type of pressure filter.~~
- ~~Tailings (waste byproduct) is the remaining ground rock that did not float into a valuable concentrate. This material is cleaned and thickened so that it can be stored on surface within an engineered facility in order to mitigate any potential impacts to the environment that could be caused by this material. The full management of tailings is discussed in detail in another chapter of this Petition.~~

~~The concentrator will generate~~The three separate concentrates of copper, lead and zinc that will be transported and sold to a smelter for further refinement into metals that can be used by industry. Transportation from Pickett Mountain will be via truck and trailer designed to haul concentrates and hauled on the existing highways infrastructure. ~~A description of this process is described in greater detail further below, discussed in~~ **Exhibit 20**.

Mineralized Rock (mill feed) will be crushed on-site and finely ground to a powder utilizing a comminution (Grinding) circuit. The finely ground rock is the feed stock for the flotation circuits, where the valuable sulfide minerals (Zn, Cu, Pb, and associated precious metals Au and Ag) are sequentially segregated from gangue minerals of no economic value and into a series of Copper, Lead and Zinc concentrates. This flotation process is done with a series of chemicals and reagents that are used to treat the minerals to optimize recoveries. Chemicals that are used within the process typically remain in the process water and are broken down over time. However, since majority of the water is reclaimed into the process, these chemicals are reused. All chemicals or potential spills are collected within the guidelines of their respective material safety data sheet (MSDS). Once collected, they are reused in the process or disposed of through the supplier or to an appropriately licensed disposal facility.

Any stored chemicals and reagents that are expired or unusable for other reasons are repackaged and sent back to the supplier or to a qualified management facility for appropriate disposal during operations and mine closure. In the event of chemical or reagent spills, the reagents are handled in accordance to the specified Material Safety Data Sheet (MSDS). A handling protocol is established for safe handling and the chemical/reagent is then used in the circuit, or if unusable, sent back to the supplier for disposal or to a qualified management facility for appropriate disposal. The non-valuable portion of the processed rock (tailings) will constitute approximately 80% of the mill feed and require tailings management. A conceptual flow diagram of the milling process is shown below in **Figure 2-17**.

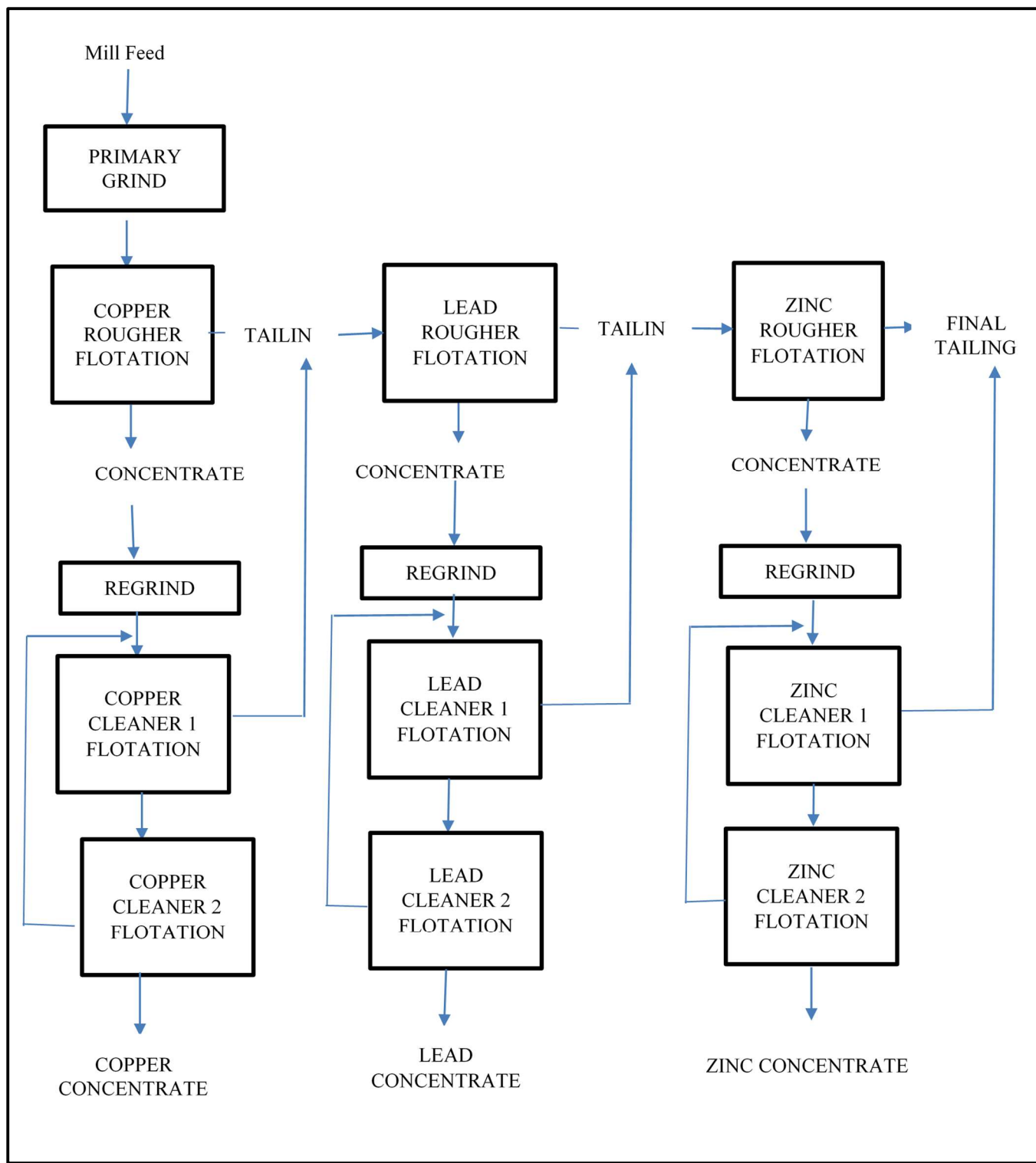


Figure 2-17: Concentrator Flow Sheet

2.2.3.5 Tailings Management

The tailings will contain some iron sulfides and other metallic sulfide minerals and are therefore managed accordingly to mitigate acid generation and leaching. Tailings are produced through the floatation process and are pumped in a slurry to be dewatered via a pressure filter and then deposited on a dry stack tailings management facility (TMF). The filtered tailings will be transported by truck to the TMF where they are spread, stacked and compacted by a dozer. All water generated by the dewatering pressure filter process is recycled and pumped back to the concentrator for reuse in the process circuit. The dewatered tailings have a low moisture content (~15-17% by mass) and is expected that no supernatant pond will form, nor will precipitation penetrate deeply as they are compacted in the TMF. Responsible Mining Solutions (RMS) was commissioned to analyze a Pickett Mountain tailings sample with respect to dewatering through thickening, vacuum filtration and pressure filtration. The tailings material filters well despite the fine grind size. The pressure filtration produced compact and dry friable cakes ranging from 12-7-17.6% residual moisture. The full analysis report is shown in **Attachment B – Ground Ore Characterization Dewatering, Rheology, Testing Campaign**

Rainfall on the TMF is expected and the run-off is collected. All TMF water will be captured in two lined collection ponds located at the north and south edges of the TMF. Water from the lined TMF collection ponds will be pumped back to the concentrator for reuse in the processing circuit and any excess water will be pumped to the water treatment plant to be treated for reuse or discharged to the environment (better than or equal to background water quality) via the infiltration system. The dewatered tailings will exit the concentrator plant via conveyor onto a storage pad with 24 hours of capacity. The tailings will be loaded and hauled via 35 or 40 tonne articulated trucks or conveyor to the TMF. The expected 1000 tonnes of tailings per day, will require 1.0 to 1.5 truckloads of haulage to the TMF per hour depending on the size of the truck. Once or twice per shift, the truck operator will spend up to one hour with a dozer and roller compactor to grade and compact the tailings. The expected cycle time to the farthest area of the TMF is under 7 hours while the closest will be 4 hours. This allows more than sufficient time for haulage, grading and compacting in a 10-hour work shift.

Sub-aerial (dry stacked) tailings are the only above ground tailings management method allowed under the MDEP Chapter 200 rules for Group A and Group B mine waste. The sub-aerial TMF will be designed in accordance with requirements (including a composite liner and leachate collection) of Chapter 200 Subchapter 5 Section 21 Mine Waste Unit Design Standards. Leachate ponds that collect water that encounters tailings are also governed by these standards. TMF ground slopes of 20% to 30% may be used for dry stack tailings. The maximum height of the TMF cells when completed at Pickett Mt. are not expected to exceed 22 feet above the ridgeline elevation. However, based on geotechnical stability of the closed TMF, the engineering limit is 55 feet.

Once compacted, these tailings will not be subject to infiltration of water and intrusion of atmospheric oxygen which will mitigate the oxidation of sulfide minerals. Management of dry stacked tailings placed within a lined containment facility, that is progressively closed during mine operation will control leaching of metals and provide long-term protection to water resources (groundwater and surface water). The TMF would be designed with run-on controls to prevent contact with surface water run-off. During the operating period of the dry stacked tailings facility, contact water (precipitation) is actively managed. Tailings solids that require placement during which time off-specified moisture values will be placed within the tailings facility and allowed to naturally desiccate and or shed water within the containment facility. Desiccation is readily enhanced by spreading the tailings with a dozer to create a larger drying exposure; this enlarged area is still relatively small within the tailings facility, given the relatively low throughput rate of the operation. Once the adequate moisture content has been reached, the tailings will be further dozed and compacted to the requisite values.

Winter operations will be handled similarly to non-winter operations except in the case of heavy snowfall or rain/ice events for both safety reasons and deposition/placement. Since the tailings will be desaturated coming from the pressure filter operations, placement via dozing and compaction can continue. Freezing conditions will thus not have detrimental impact on the normal filtration and placement operations. If non-specified tailings with some excess moisture is placed, these can be stored for up to several months if needed, since the throughput is relatively small; once normal operations resume with low moisture content, the temporary contained tailings can be incorporated into the operations. It is anticipated that an area of 4 acres is sufficient to store the winter season of tailings temporarily if consistent freezing conditions occur resulting in the inability to manage tailings through standard management processes.

Tailings (rock byproduct) is the remaining processed rock that did not float into a valuable concentrate. The conceptual design developed for the PEA (**Exhibit 13 - Attachment B**) was focused on confirming the availability of adequate space to accommodate the proposed tailings storage facility (TMF) and support planning for geotechnical subsurface investigations and geotechnical and rheological testing of processed ore (tailings).

Management and disposal of the mill tailings in a filter-cake consistency was selected to minimize risks related to the physical stability of the tailings and satisfy the MDEP Chapter 200 Metallic Mineral Exploration, Advanced Exploration, and Mining regulations set by the Maine Department of Environmental Protection. A slight reconfiguration to the original conceptual TMF footprint was made for the PEA in order to satisfy wetland and groundwater protection issues. Future design stages will be focused on optimizing the layout (within the same location), staging, and development of the TMF within the proposed footprint.

Some metallurgical testing has been completed to try and separate tailings further into a high Sulphur content portion and low Sulphur content portion. This would mean that sulphides and residual metals would be even further removed from the low Sulphur content portion resulting in a few additional options for management. These theoretical options are:

- Sell high Sulphur content portion as fuel for smelting leaving only the low Sulphur content portion for on-site TMF storage
- Store the high Sulphur content portion in the center of the TMF and surround it in the low Sulphur content portion resulting in further protection from leaching and acid generation.

Until more detailed metallurgical test work has been completed, it is not possible to confirm if a high Sulphur and low Sulphur tailings could be generated via additional floatation. The tailings TMF design, however, is conservative and accounts for the highest possible potential risk. The tailings material is pressure filtered to remove majority of associated water and then transported, placed and compacted on an engineered Tailings Management Facility (TMF) in order to prevent potential adverse impacts to the environment. The TMF design has been completed by SLR Consulting. Key Project design criteria, assumed for the TMF, are summarized as follows:

- **Life of Mine** (Commercial Production): 9 years (10-15 total project life)
- **Mined Tonnes:** 4,100,000 tonnes (4,520,000 tons)
- **Tailings Produced:** 3,280,000 tonnes (3,620,000 tons)
- **No Underground Tailings Backfill**
- **Dam Classification:** Significant (CDA, 2013)
- **Environmental Design Flood:** 500-year 24-hour storm (7.8 inches)
- **Inflow Design Flood:** 1,000-year 24-hour storm (8.5 in)
- **Contact Water Containment:** composite liner system with leachate collection system
- **Contact Water Drainage:** maximum 1 ft head above containment system liner

- **Seepage Control Measures:** collection pond with water reused by mine/concentrator or treated and discharged
- **Closure Cover:** composite liner system with drainage layer and soil cover for vegetation growth

The TMF is comprised of the following design components:

- Containment system, consisting of a composite liner system, to minimise the seepage to the environment.
- Perimeter berms to provide containment of the tailings.
- Collection Pond to store excess contact water.
- Collection Ditches to convey contact water to the Collection Pond; and
- Surface Water Ditches to convey fresh, or non-contact water, around the TMF.

The design and operation of a filter cake disposal facility is dependent on tailings to the specified consistency, (i.e., filtering to near optimum moisture content to allow for placement and compaction). Additional rework of the tailings may be necessary to achieve the optimum moisture content and design dry density.

Figure 2-1 (Exhibit 2 - Attachment A) identifies the location of the TMF and appurtenant structures.

Surface disposal of filter-cake tailings is a relatively new approach introduced by the mining industry and adopted commonly in the recent decade to optimize the costs and minimize risks associated with tailings dams. However, the technology is well developed from the use of filtered and paste (dewatered) tailings as an underground mine backfilling method. Dewatered tailings have also been used successfully at various mines for surface disposal or tailings, including mines with a similar climate and production rate to Pickett Mountain:

- Myra Fall, BC, Canada – 3,600 tons per day, deposited as a paste consistency (pumped), with a cemented paste liner to reduce seepage and the risk of tailings rush-in to the underground mine. Available reports do not indicate the presence of a geomembrane liner or planned geomembrane cover. The publicly available records do not indicate any groundwater impacts have occurred.
- Minto Mine, Yukon, Canada – 3,800 tons per day, deposited as a compacted filter cake. The reports indicate the TMF (Tailings Management Facility) has no liner. A proposed 1m soil cover is planned for closure. The publicly available records do not indicate any groundwater impacts have occurred.
- Greens Creek, Alaska, USA – 750 tons per day, deposited as a filter-cake on surface and as underground backfill, the TMF includes a geomembrane liner under part of the tailings area and the collection ponds are lined and a soil cover will be placed for closure. Some zones of saturation in the TMF have been reported but these have been managed within compliance. The facility is reported to be performing within environmental compliance guidelines, despite only having a partial tailings liner. Surface and groundwater water quality is reportedly within geochemical predictions developed during mine permitting and the facility is performance is satisfactory. Pickett Mountain will be constructed using a fully engineered liner system throughout the entire footprint of the tailings facility compared to the Greens Creek semi lined facility. This will give Pickett Mountain an even more positive result related to ground water impact.



Figure 2-18: Hecla's Greens Creek in Alaska Tailings Management Images Between 2004 and 2017

Generally, filter tailings stacks have been shown to be safe and reliable and the noted case studies along with numerous examples with higher production rates or varying climates provide a reference framework for identifying and addressing design challenges. In essence, the system of mechanical dewatering is designed to produce a waste that can be managed safely. The Pickett Mountain TMF will have full composite basal liner and a composite closure cover that encapsulates the tailings and inhibits infiltration.

A further example of similar tailings deposition is Cerro Lindo (Peru) shown in **Figure 2-19**. Although the climate in Peru is drier than in Maine, the concept is the same. Sub-aerial tailings are currently used in other cold regions including Alaska, Minnesota and Canada. In most cases in cold weather climates, the tailings are progressively covered to optimize water treatment and reduce the remaining area requiring closure during final reclamation. The MDEP regulations require a cover system of permeability equal to the liner system which has specific maximum permeability requirements.

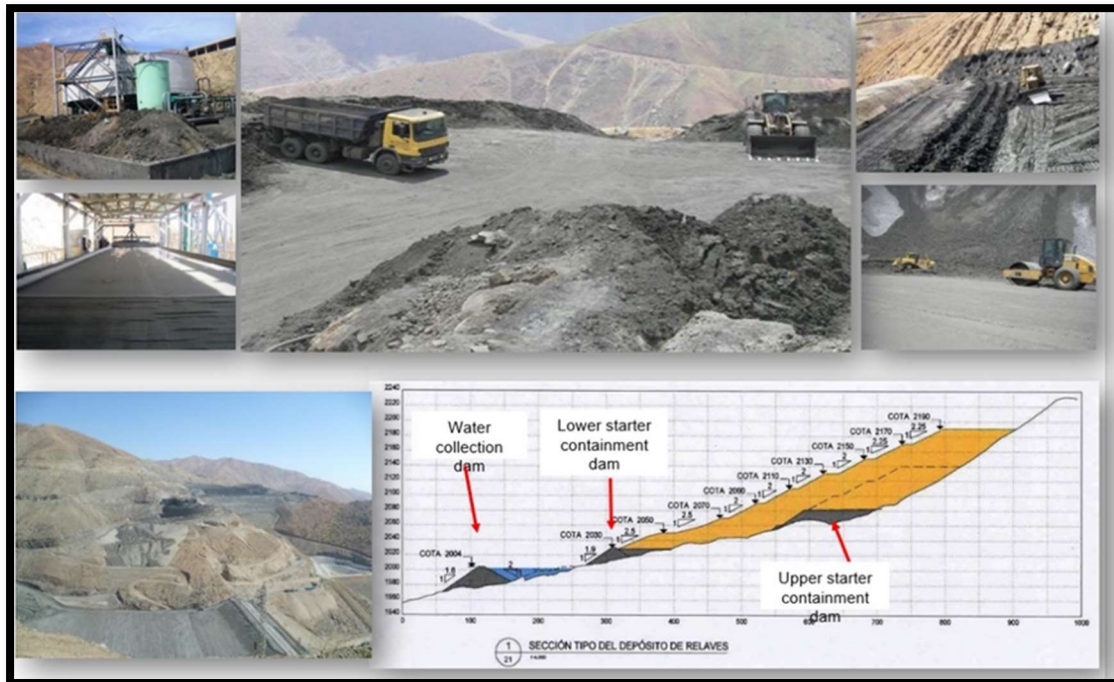


Figure 2-19 Cerro Lindo Moist Cake Disposal (1:2 Slope)

Tailings Base Grade and Containment System

The base or foundation of the TMF will generally follow the natural topography of the ground surface, sloping from the topographic divide downwards to the Collection Pond in the north. The topographic ridge features two small crowns (approximately 6 ft tall) that will need to be regraded to provide positive internal drainage to the Collection Pond on the north and south side of the TMF.

A containment system is required by MEDEP Chapter 200 mining regulation (Maine, 2017) consisting of a composite liner and drainage layer. Contact water collected above the composite liner will gravity drain to the Collection Ditches and ultimately the Collection Ponds. Contact water will be recirculated to the concentrator. Minimal contact water in excess of the concentrator requirement will be directed for water treatment and discharge.

- The containment system is comprised of the following components, from bottom to top:
- ft minimum thick low permeability soil fill (permeability less than 1×10^{-6} centimetres per second (cm/s));
- 60 mil High Density Polyethylene (HDPE) geomembrane; and
- 2 ft minimum thick Drainage Collection Layer.

The containment system is required to also ensure that the contact water head does not exceed 1 ft above the HDPE liner. To satisfy this condition, a series of perforated, corrugated polyethylene (PCPE) drainage pipes will be installed within the free draining Drainage Collection Layer.

The relatively uniform subgrade and HDPE liner configuration is important for gravity drainage to the collection ponds. In addition, this configuration essentially eliminates potential stability concerns related to the low interfacial friction angle between the geomembrane and the underlying compacted soil liner.

Tailings Perimeter Berm and Ditch

A 3 ft to 10 ft high perimeter berm will be provided along the toe of the TMF. The berm will be used for anchoring the geomembrane liner and for creating a Collection Ditch for contact water collection along the tailing's perimeter. The height of the perimeter berm will be a function of the length of the tailings slope. The south side of the TMF is situated on flat ground and will have a minimum berm height of 3 feet, while the north side of the TMF is situated on a slope and will have a maximum height of 10 feet.

Filtered tailings will be placed up to the perimeter berm, maintaining a minimum 3 ft deep ditch between the filtered tailings and berm slopes. The grade of the ditch will follow the natural topography. Grading will be required on the topographic divide through a grading plan that ensures a minimum 1% slope that drains toward the east side then turning and draining downhill south to the Collection Pond. Borrow from the cut of the two crowns can be used to regrade the lower areas in between. If insufficient soils depth is found while cutting the two crowns, then imported borrow material will be used for grading the lower areas.

The perimeter berm will be notched at the low point in the TMF to allow drainage from the TMF to the Collection Ponds.

Tailings Drainage Collection Ponds

Contact water from precipitation and tailings seepage will drain into the perimeter Collection Ditch system, which ultimately drains to the Collection Pond on the north and south side of the TMF.

The Collection Ponds are sized to contain a total of 11.3M gallons, which is the anticipated run-off from an Environmental Design Flood (EDF) in addition to the maximum operating level. SLR sized the Collection Pond based on the following:

- SLR assumed a maximum operating pond volume of 1.3M gallons for a tailing's facility of this size and with progressive reclamation potentially reducing the quantity of contact water generated. The filtered tailings are relatively dry with an estimated gravimetric moisture content of about 18% which SLR expects to result in very little free water to drain out. Rainfall is expected to be the main source of contact water, and some infiltration is expected to report as tailings seepage.
- The EDF criterion for the Project is defined as the 500-yr 24-hr. event required by MDEP Chapter 200 mining regulations. SLR calculated an EDF volume of 11.3M gallons to be stored in the Collection Ponds based on a the lined TMF footprint area of 50.5 acres, a 500-yr 24-hr. event of 7.8 inches and a run-off factor of 90%.

SLR assumed that the containment berms for the Collection Pond will be constructed by placing and compacting soils excavated from within the Collection Pond footprint. The Collection Pond will be constructed with a similar containment system as the TMF to prevent solution seeping into the groundwater, and is comprised of the following components, from bottom to top:

- ft minimum thick low permeability soil fill (permeability less than 1×10^{-6} cm/s)
- 60 mil HDPE geomembrane

A spillway equipped with a rip rap protected channel and energy dissipation downstream of the south side of the pond will prevent overtopping and will be sized to safely pass the IDF event, defined as the 1,000-year 24-hour event. The water discharged by the spillway will drain overland north to Pleasant Lake or south to Pickett Mountain Pond. In the event of such a major storm, rainwater would be pumped directly into the mine in order to prevent usage of the spillway. If an event of this nature were to occur and the mine workings

flooded, this would degrade the installed ground support and would cause a series of reconditioning work to regain access to those workings after the mine was dewatered. Any electrical motors would be disconnected and brought to safe and dry elevation prior to allowing water to fill up the mine working therefore, not major concerns on electrical components would be realized. However, electrical cabling would likely be submerged. Submerged and dried electrical cable is tested for safe use and if testing fails then the cables are replaced along with replacing all of the damaged or impacted ground support.

Additional Considerations for Collection Ponds

The collection ponds are provided at the perimeter of the facility to collect tailings seepage and surface runoff. Collected water would be pumped to the process plant for use as make-up water. The collection ponds are geomembrane lined to inhibit outward seepage.

Unlike "infiltration ponds" which require an adequate depth of well-drained soils for infiltration (e.g. septic wastewater ponds) the collection ponds will be created using a combination of excavation, berm construction, and/or engineered fill to create the required storage volume and protect groundwater. The design considerations will include the depth or thickness of overburden, the depth to groundwater, and risk issues.

Figure 2-20 shows schematic pond construction concepts that will be considered at the design stage:

- Bermed
- Partially excavated
- Engineered fill

Detailed site reconnaissance and geotechnical investigations will be carried out at the design stage to optimize the configuration of the ponds.

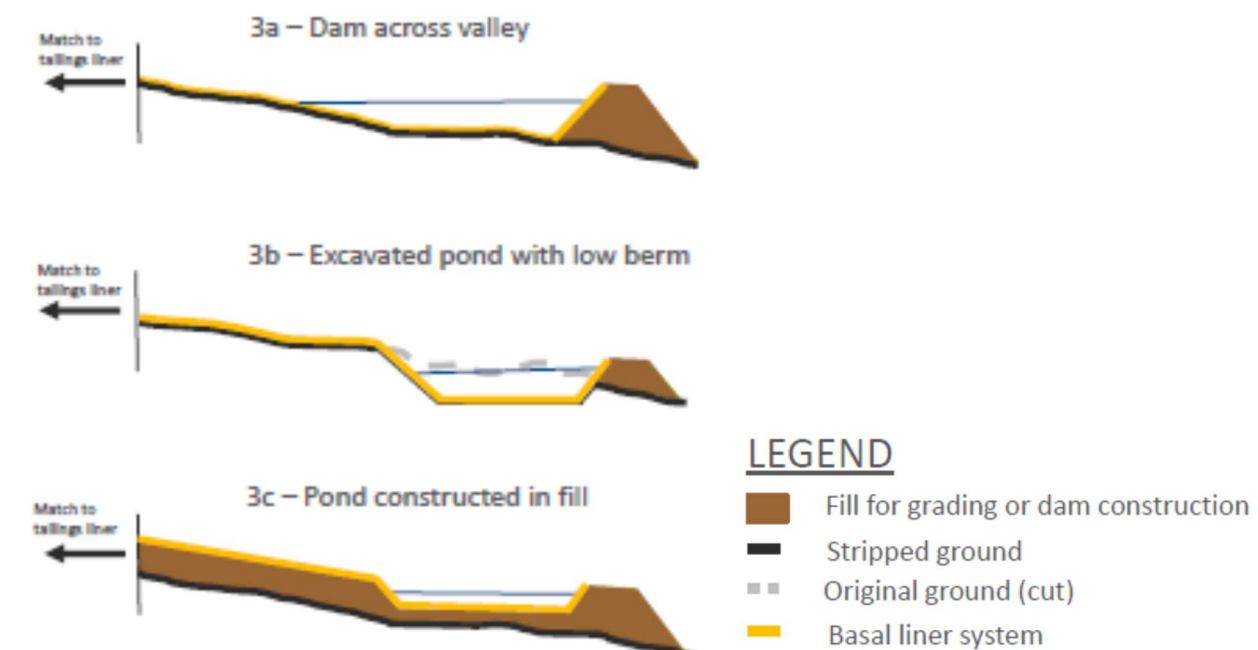


Figure 2-20: Alternative Collection Pond Design Concepts

Operational Controls & Monitoring

Filter-cake tailings that are produced according to (future) design specifications and placed and -compacted at the design moisture content that will provide a configuration and geometry that are stable. With a proper engineering design, concurrent reclamation, and operating procedures, minimal wind and water erosion impacts are anticipated.

The hydraulic conductivity of the compacted tailings is expected to be low due to the particle size distribution based on precedent global experience. Infiltration into the tailings mass should occur at a very low rate during and following placement of the tailings. Piezometers will be placed throughout the TMF to record the phreatic level data and confirm operational performance according to the design intent.

Wet or off-specification tailings may be produced in the plant during periods of filtration plant upset or malfunction. During these periods, the tailings will be placed interior to the pile to avoid potential complications with slope stability. Subsequent lifts will not be placed on wet tailings until drainage and compaction occur. This is to avoid creating a hydraulic gradient that could saturate the underlying tailings. Wet tailings storage locations will be rotated periodically to comply with the design intent.

Progressive reclamation and geomembrane cover placement will limit infiltration further, minimize operational controls required to avoid runoff erosion of tailings placed on the slopes and eliminate tailings dusting concerns.

Tailings Stability and Risk

Compaction requirements typically vary throughout the facility depending on the design requirements. Roller compaction is typically specified to achieve the target density values required to satisfy stability requirements if earthquake resistance is a concern, or steep slope inclinations are required to achieve the required storage volume. Precedent data on stability and seismic loading resistance is available for the Cerro Lindo Mine which was subjected to strong earthquake loading. Lara and Leon (2011) highlights how the properly place filtered tailings did not liquefy or deform in any significant manner during strong earthquake motions (Richter magnitude 7). Uncompacted filtered tailings in an upset disposal area suffered only incremental movements (i.e. cyclic mobility) but did not liquefy and flow. The Cerro Lindo case study provides a strong case record for filter-cake tailings stack stability.

At Pickett Mountain the seismic risk is low and there is adequate space to use shallow external slopes selected to satisfy post-closure aesthetic considerations. The PEA (**Exhibit 13 – Attachment B**) concept has external slopes of 4 horizontal (H) to 1 vertical (V), which are flatter than required for stability, even considering the limits of the geomembrane-soil interfacial friction angle. Stepped steeper slopes of say 3H:1V, for example, are common for closure covers on tailings facilities and landfills. Dozer track-packing is likely sufficient to meet the design intent, however roller compaction for the Pickett Mountain is planned to densify in order to inhibit infiltration of runoff and reduce erosion by storm runoff and wind (i.e. dusting). Roller compaction serves to further increase the target density in order to support the construction equipment, maximize density and storage capacity, and reduce the hydraulic conductivity.

The basis for sizing the TMF includes placement and compaction of the tailings in a lined storage facility. Tailings will be dewatered by thickening to approximately 60 to 63% solids by mass (mass solids/total mass) followed by pressure filtration to approximately 83 to 85% solids with approximately 15 to 17% moisture content by mass. Based on a specific gravity of 3.25 and a compacted void ratio of 0.6 (volume voids / volume solids), SLR estimated the filtered tailings density to be 125 pounds per cubic foot.

The TMF size in the PEA had an average height of about 22 ft above the ridgeline based on 4.5 million tons of tailings over a 54-acre footprint, and tailings dry density of 125 pcf. At the design stage the configuration and geometry of the final TMF geometry will be determined to meet post-closure land use and aesthetic values agreed through the approvals and consultation. Potential areas of lateral expansion are available for optimization and identified with hatched lines in **Figure 2-1**.

Figure 2-21 is a schematic cross section of the tailing's facility. There is no pond on the surface of the tailings. Perimeter berms and ditches will direct seepage and surface runoff to the collection ponds for pumping to the concentrator and mine for processing reuse.

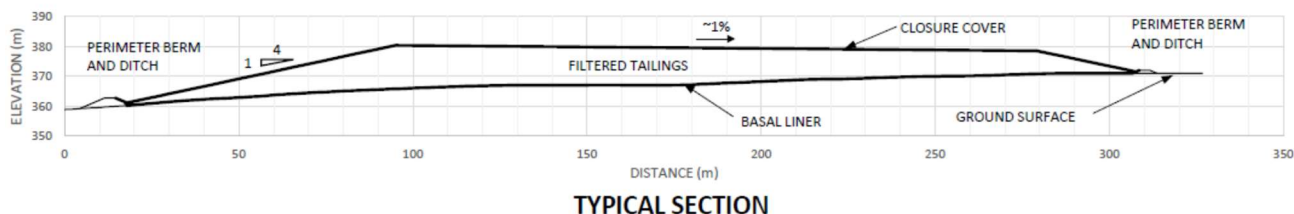


Figure 2-21 – Longitudinal Section Through The Tailings Management Facility

2.2.3.6 Security

Security for the project site will be managed through a series of installed physical barriers as well as a 24-hour active-duty security contract. Physical barriers will be inclusive of fencing and gates around restricted access locations such as but not limited to, ponds, material storage areas, high voltage electrical areas and any openings to underground. Additional fixed barricades will be locations at any known access to the proposed project site at the rezoned boundary. In addition, signs restricting passage will be posted along the perimeter of the rezoned boundary to ensure that people approaching the site are notified of the restriction. Guard house and gate will be located at the east boundary of the property and main access. Any person or vehicle entering or exiting the project site will need approval and documenting by the security team and systems prior to entry or exit. The fixed barricades as well as guard house are identified on **Figure 2-1**.

2.1.42.2.4 Phase 4 – Reclamation/Remediation

2.2.4.1 Reclamation/Remediation Strategy

The overall design and operational strategy at Pickett Mountain is are to limit and maintain a small environmental impact footprint and thereby limit potential impacts throughout all phases of the project (construction and operation). For example, as the project generates tailings from production, they will be stored placed and capped in separate cells, an estimated 5 tailings cells over the life of the project, such that a completed cell will be closed and reclaimed while the next cell is in use. A series of three tailings cells will be constructed throughout the project life. Closure of the first cell will be completed after it has been filled to design capacity. Cell 2 will be constructed in conjunction with this timeframe to ensure continued operation of the concentrator facility. Cell 3 will be developed prior to cell 2 closure. Closure of each cell will consist of a similar process described later in this report which will spread the closure and reclamation over the life of the project, rather than at the end. The ongoing closure can be monitored and adjusted to maximize efficiencies and monitor effectiveness, maximize operational efficiency, and continuously improve on designs and operations.

Upon completion of the project, final reclamation activities will take place. These activities will be based on a previously engineered and approved reclamation plan required by the mining application. ~~A description of this process is described in greater detail in a subsequent section of this Petition.~~

The majority of the required reclamation work will be completed by a skilled workforce from the state and include:

- Decommissioning, sale and salvage of steel and site buildings.
- Break up and removal of foundations.
- Removal and disposal of approved demolition debris into underground openings and all remaining debris transported to an appropriate licensed landfill facility.
- Ground surface cleanup and contouring.
- Spreading overburden, soils and final capping material (vegetation and seeding) on the impacted sites and final tailings cell.
- Construction of underground opening blockages (plugs-~~)).~~
- Removal of ~~pond~~unused water retention ponds and storage pad infrastructure.
- Continued operation of water treatment facility and monitoring of water quality until such time no treatment is required, and the remaining infrastructure can be removed.

After site reclamation and closure, continued monitoring will take place to confirm closure and reclamation activities have been effective at preventing contamination of the environment surrounding the site. The frequency of monitoring will periodically be reviewed with MDEP adjusted as appropriate. Visually, the entire site will be contoured to its current topography. Exceptions to this are the tailings management facility and potentially an area such as the mine portal that could be restored in a manner that provides enhanced habitats for bats. The tailings facility will reach a height of approximately 22 feet above the ridgeline and will be contoured to blend in with the current topography during cell closure activities. A top liner over each of the tailing's cells, below the final soil layer, will inhibit deep root growth and restrict vegetation growth on top of the closed tailings facility to grasses, smaller shrubs and alders. The tailings facility will remain shaped to shed off water while maintaining erosion control. No precipitation pooling on top of the tailing's facility will take place during or after operations.

In the active phase of closure, water treatment and environmental monitoring will be required until it is demonstrated that the site conditions meet pre-mining conditions. As the site reaches a passive phase of closure, no additional treatment or monitoring is be expected.

A closure cover, consisting of a composite liner equivalent to the basal liner, is required to be constructed over the TMF (Maine, 2017).

The closure cover liner system is comprised of the following components, from bottom to top:

- 0.6m/(2 ft thick low permeability soil fill (permeability less than 1×10^{-6} cm/s)
- 1.5 mm/60 mil HDPE geomembrane liner
- 0.3m/1 ft thick drainage layer
- 0.3m/1 ft thick random soil for a root penetration layer.

- 0.15m/0.5 ft thick topsoil vegetation growth medium, revegetated with small grasses and shrubs

At closure, the contact water collected in the Collection Pond will continue to require treatment until water quality meets regulatory requirements. Once the water quality requirements have been met, the geomembrane may be removed, and the Collection Pond breached and removed to prevent future accumulation of water with the area covered with soil and vegetated.

Selective areas of the TMF will be progressively reclaimed during the operations phase by installing the closure cover system. Reclamation will be limited by the areas of the cell that are final and do not tie into an adjacent cell (i.e., the internal boundaries of the cells should not be reclaimed). Progressive reclamation will allow the closure costs to be spread out into the operating period, allowing the closure construction to be reduced in cost and duration in addition to providing an opportunity to evaluate and improve on the closure cover performance. It is estimated in this petition that an average of 50% of the TMF will remain exposed throughout the duration of the project while 50% of the TMF will be undeveloped or closed and remediated throughout the duration of the project until final closure when 100% of the tailing's facility will be closed and remediated as described above.

2.2.4.2 Reclamation/Remediation Cost Estimate

The reclamation and closure costs include the cost for the closure of the last remaining TMF cell is \$1,226,081. The cost for the closure of all other TMF cells is included as sustaining capital throughout project operations. The cost for building demolition, remaining mine backfill, and site grading/re-vegetation is estimated at \$2,200,000, \$600,000, and \$978,393, respectively. The total reclamation and closure cost of \$5,004,474 for these elements will be paid for through salvage income following the cessation of mining. Salvage income is expected to be in the range of \$5,200,000. Details related to reclamation and remediation costs are included in **Exhibit 13** – Attachment B A-Z Mining Professionals Limited – Preliminary Economic Assessment Pickett Mountain Project

2.2.4.3 Unplanned or Extended Reclamation/Remediation

In a circumstance that the operating project must be shut down, reclaimed and remediated prior to the intended full project cycle (10-15 years) Chapter 200 requires a "Worst Case Scenario" evaluation be completed and used to support a Financial Assurance Trust Fund. The financial assurance trust fund is held by the MDEP prior to approval of a mining permit and can be used by the MDEP to reclaim and remediate the project in the unlikely event that Wolfden is unable to fund closure and reclamation expenses.

While evaluating the worst-case scenario, a series of scenarios were considered and evaluated. All scenarios assume that Wolfden was unable to accumulate revenues sufficient to fund the worst-case scenario closure and reclamation.

1. Significant failure of underground workings causing technical closure.
2. Tailings Failure – Slope failure and runout of a temporary external slope during operations caused by a strong earthquake following an extended period of TMF mismanagement leading to complete saturation of the slope.
3. Tailings Failure - Incremental slope deformation or cyclic mobility of a portion of a TMF slope after placement of the closure cover resulting in limited mobility but damage to the closure cover requiring repair.

Significant failure of underground workings would be a significant or series of significant falls of ground (Cave in) of rock into openings underground. This could be caused by poor quality rock insufficiently supported, seismicity, or poor blasting practices. It is Wolfden's top priority to ensure that the health and

safety of all people at a project are protected. Attention to geotechnical design and monitoring, as well as high quality blasting practices are also top priorities while designing and operating a mining project like Pickett Mountain. In the unlikely event of a significant failure of process and control, and a large ground failure event occurred, all employees would be safe on surface or escape through secondary egress routes to surface. If the event was significant enough to justify a cease in operation of Pickett Mountain, then the site would be reclaimed as described in **Section 2.2.4.1**. The cost of reclamation is not anticipated to increase because the same reclamation process would be applied.

A tailings slope failure and runout of a temporary external slope is estimated to cost an additional \$1.88 million over and above the planned reclamation of the project site. A tailings incremental slope deformation of cyclic mobility of a portion of a TMF slope after placement of the closure cover causing damage to the cover is estimated to cost an additional \$0.98 million over and above the reclamation of the project site. Both tailings failure scenarios are discussed in **Attachment B – SLR Wolfden TSF Failure Modes (5 June 2021)**. The economic model identified the PEA in Exhibit 13 consists of \$2.0 million in contingency related to the tailing's facility capital. This provision is considered appropriate given the estimated worst case additional cost is **\$1.88 million**.

2.2.4.4 Financial Assurance Trust Fund

The Financial Assurance Trust fund, required by MEDEP, is included as capital cost in Year (-2). The total cost for the Financial Assurance Trust used in the PEA is \$13,684,557. This considers a present value from future costs at a discount rate of 2% based on standard federal rates and does not include any salvage value for assets at closure. Details related to reclamation and remediation costs and the Financial Assurance Trust Fund are included in **Exhibit 13 – Attachment B A-Z Mining Professionals Limited – Preliminary Economic Assessment Pickett Mountain Project**

2.3 Acreage

The total acreage to be rezoned for Pickett Mountain is 600.1 (i.e., 646 areas less 45.9 acres of existing PLS-2) of the wholly owned, contiguous 7,145 acres (by deed).

Planned Development Subdistricts

The proposed development will require permitting under Chapter 200 by the DEP. Rezoning approval is required by LUPC. This Petition addresses the additional requirements of the LUPC's Chapter 12 rules. The applicant has prepared this Petition in consultation with the LUPC and other relevant agencies.

2.4 Consistency with D-PD Development Subdistrict Standards

This narrative addresses the nature and basis for the requested subdistrict change and describes how the project will be consistent with the D-PD development standards applicable to the project.

Metallic mineral mining in the unorganized jurisdiction requires a rezoning to a Planned Development Subdistrict, which is a district that allows for large-scale well-planned developments that depend on a particular natural feature or location that is available at the site. After purchasing the site, Wolfden has continued timber harvesting and exploration of the Pickett Mountain deposit through geophysical and geochemical analysis through to borehole exploration (diamond drilling). This exploration work is described in detail within the Preliminary Economic Assessment (PEA) located in **Exhibit 13 - Attachment B**.

The mineralized rock at the Pickett Mountain Deposit contains high grade concentrations of zinc, and lesser copper, lead, gold and silver at tonnages indicating the project is economically feasible and can be financed

and completed. Financial capacity and project financing are discussed in **Exhibit 13**. Wolfden, through its own engineering staff, its current specialized consultants in metallurgy and tailings management, supported by the mining engineering capabilities of several consultants, has the technical capacity and expertise to design, construct and operate the project through final reclamation.

A demonstration that the project will not adversely impact plants or habitat is provided in **Exhibit 25**.

The project locations are described in **Exhibit 1**

The project location is approximately 6 radial miles from Patten, the closest town. The project location is entirely dependent on the presence and location of a potentially economic mineral deposit. The project location is exempt by definition from adjacency. The proposed rezoning includes 646 contiguous acres which meets the minimum requirements under Chapter 10 (10.21,H (D-PD)) of 50 acres for metallic mineral extraction projects. Of this, approximately 158.6 acres will result in surface disturbance to construct necessary mining facilities. Wolfden has evaluated project mining requirements to minimize the footprint of the proposed project and to place above ground facilities adjacent to each other to construct a compact and efficient operations area. The remaining area to be rezoned encompasses the subsurface areas of mineralized rock and subsurface treated water infiltration galleries, and buffers around surface facilities. The rezoning will occur entirely within a General Management subdistrict and is not adjacent to and will not impact Protection subdistricts in affect at this time. Within a three-mile radius of the site, the protection subdistricts present include forested and scrub-shrub wetlands adjacent to great ponds (Pickett Pond, Pleasant Lake and Mud Lake) and associated stream drainages, and wetlands of special significance between Mud Lake and Pleasant Lake. Fish and wildlife subdistricts are located to the northwest. A recreation subdistrict is designated surrounding Green Mountain Pond and Lane Brook Pond, located greater than 3 miles from the site. The location map showing the existing conditions, proposed structures and existing and proposed subdistrict boundaries is provided on **Figure 2-22 (Exhibit 2 - Attachment A)**.

The project operations will include comprehensive engineered facilities to collect and treat waters that come in contact with rock and earthen materials that are mined in the subsurface and brought to the land surface for beneficiation or long-term management. These water collection, treatment and treated water recharge facilities have been designed to protect groundwater and surface water quality during and after active mining in order to meet the stringent MDEP Chapter 200 regulations. The measures to ensure protection of ground and surface waters are described in **Exhibit 10**. The plan for mine reclamation outlined in subsection 2.2.4, describes how the affected areas will be restored and returned to pre-existing or comparable conditions including forested habitat at the end of the project.

As described in this Petition, the project is located at distances greater than 400 feet from any property line, is reasonably self-sufficient and self-contained, provides for its own water and domestic sewage services (**Exhibit 23**), maintenance of roads (**Exhibit 20**), solid waste disposal (**Exhibit 18**) and to the extent possible, fire protection and security (**Exhibit 16**).

This Petition contains discussion of other required criteria under Chapter 12 of the LUPC's rules for Mining and Level C Mineral Exploration Activities. Based on these considerations, the proposed rezoning is consistent with the D-PD subdistrict standards.

2.4.1 Alternatives Analysis

The D-PD rezoning criteria include a determination that the site is the best reasonably available for the proposed use and that the goals and policies of the comprehensive Land Use Plan are served. Mining must occur where the resource is located. This location was identified through a series of geo chemical and geophysical surveys followed by exploration drilling of the deposit. Geological logging of core samples has

confirmed that the Pickett Mountain deposit represents a high value base metals ore deposit. At the request of the LUPC staff, Wolfden has evaluated not only whether this is the best reasonably available site for removal of ore, but whether it is the best reasonably available site for the entirety of the project operations, including the concentrator, tailings and supporting infrastructure. For the reasons described in the Petition, the site is well-suited for the entirety of the project (not visible, minimal impact to surrounding environment including wetlands, surface and ground waters, or recreational resources, suitable soils for the purpose of the project components, etc.). Nonetheless, Wolfden has evaluated whether there are alternative, potentially more suitable, locations for the concentrator, tailings and supporting infrastructure that are practicable, taking into account project economics, regulatory requirements and site availability.

2.4.1.1 Site Level Options

Option 1, **Figure 2-23** (Option 1) was developed from initial data obtained from various sources and served as a high-level review of preliminary base line data which included: State Lidar, and Aerial Imagery from MeGIS, soils from NRCS and wetlands from NWI. Based on all of this information, and the space required for all of the various mine facility elements, the layout was created and designed to avoid natural resource features (wetland and streams) and to minimize any environmental impacts. With the layout of the mine facilities complete, the pretreatment water storage pond located. This pond serves to collect impacted water from the mining operations where any water that requires treatment is piped to the on-site water treatment plant (WTP). The treated clean water is distributed for re-infiltration to ground via the proposed IG's (infiltration galleries) and a groundwater management distribution system.

Option 2, **Figure 2-24** (Option 2) was developed through further analysis of the initial data and subsequent field data acquired to determine the approximate depth to groundwater and bedrock. This option relocated the low-grade ore pad (Map ID 30), waste rock storage facility (Map ID 26), warehouse (Map ID 25) and laydown area (Map ID 14) due to constraints associated with surrounding wetlands, shallow groundwater table and depth to bedrock. Additionally, a post treatment clean water storage pond (Map ID 35) was added to the alternative which will provide storage and controlled release of treated clean water to the IG's (Map ID 5, 18, 19, 20 & 21).

Option 3, **Figure 2-25** (Preferred Option 3) was developed to further refine option 2 based on minimizing impacts to groundwater and bedrock. This option relocated the low-grade ore pad (Map ID 30) to the east based on better soil conditions; the northern proposed access road was tied into the Tailings Management Facility (Map ID 11) for better ease of operations with the waste rock storage facility (Map ID 26). The pre and post treatment water storage ponds (Map ID 27 & 35) and Water Treatment Plant (Map ID 28) were moved west for ease of operations and more centralized for piping water to the overall facility. The IG's (Map ID 5, 18, 19, 20 & 21) were relocated downgradient of impervious facilities and upgradient of wetlands and streams to replace surface water collected by the pads or drainage of the site. The approach is to maintain a more consistent water balance and to be able to replenish groundwater in certain areas, where required to maintain the hydrology that currently supports the streams and wetlands.

2.4.1.2 Regional Alternatives Analysis

To ensure that the most well-planned location was selected for the project site, an evaluation was completed of several location options for the various project components. The proposed mine and supporting infrastructure must remain near the Pickett deposit due to the physical location of the metallic minerals. Alternative considerations focus on the location of components such as the concentrator, tailings management facility and supporting infrastructure. The following is a review of the base case metrics followed by a description of each alternative considered and the equivalent metrics to the base case. Metrics of interest between alternatives are aimed at providing a safe, environmentally responsible project that

minimizes or eliminates impacts. Also, consideration is given to a project that provides an appropriate return on investment to support the project economics.

2.4.1.2.1 Base Case

The Base Case option is as described in detail throughout the petition and allows for construction of a fully encompassing project site, directly adjacent to the Pickett Mountain deposit. The location has been chosen for several reasons. Descriptions of each metric of consideration is shown below.

Economics

The economics of the project, although robust, can significantly vary based on various alternative locations for the concentrator, tailings management facility and supporting infrastructure. The table below displays the project operating costs related to the base case proposal.

Table 4: Project Operating Costs

<u>Project Operating Costs</u>	
<u>Underground Mining (\$/t)</u>	<u>\$47.73</u>
<u>Processing (\$/t)</u>	<u>\$31.25</u>
<u>Dry Stack Placement of Tailings (\$/t)</u>	<u>\$1.30</u>
<u>Surface Services (\$/t)</u>	<u>\$2.31</u>
<u>General and Administration (\$/t)</u>	<u>\$7.69</u>
<u>Environmental and Sustainable Development (\$/t)</u>	<u>\$2.10</u>
<u>Total</u>	<u>\$92.39</u>

Socio Economics:

The socio economics impacts in the base case option are also positive and significant when compared to other businesses in the region with an estimated economic injection of \$670M and a total addition of 4,240 job years.

<u>Total Spending</u>	<u>Total Output</u>	<u>Total Earnings</u>	<u>Total Job Years</u>
<u>\$591,647,100</u>	<u>\$669,725,900</u>	<u>\$233,737,900</u>	<u>4,240</u>
<u>Implied Multipliers</u>	<u>1.13</u>	<u>0.40</u>	<u>7.17</u>

Soils:

A soils suitability field survey and evaluation were completed for the Base Case option site. The soils for the Base Case option facilities are suitable for construction/installation and are typical of soils within the northern region of the state. The soils below the tailing's facility are generally shallow to bedrock, however, shallow soils depth for this structure is most favorable for long term stability and lowest possible risk with respect to a catastrophic failure. The slopes are relatively flat in this location and the groundwater would not be impacted as the TMF would have an impermeable liner structure during construction and operation as well as post closure. The concentrator complex is located in an area with deeper soils. Although it is proposed in an area that is sloped, the concentrator complex is designed with a stepped foundations and stepped storage pads and buildings to be built above existing ground surface and generally following

existing topography. This is considered ideal for taking advantage of gravity to reduce pumping requirements within the concentrator flotation circuits.

Wetlands and Water:

A full delineation of wetlands and surface waters throughout the base case site has been completed. The project has been sited to avoid any direct impacts to wetlands and streams. Additionally, as demonstrated in **Exhibit 10**, the water treatment plan ensures that water discharged to the infiltration galleries will meet background levels and the water balance plan ensures that surrounding surface waters will not be indirectly impacted due to changes in the water quantity.

Viewshed Impact:

As discussed in **Exhibit 15**, the impact to viewshed related to the base case alternative is minimal with 2 potential viewpoints being impact. One on an ATV trail north of Mount Chase and the other from a hiking trail to the summit of Mount Chase.

Recreational Uses:

The project will not impact recreational activities outside of the proposed rezoned boundary including access for traditional recreational activities including ATV and snowmobile trail connectivity. If a concern is identified related to the health and safety of Wolfden's employees or the general public, then Wolfden will ensure that modifications to or relocation of connectors will be implemented to address that concern.

2.4.1.2.2 *Alternative 1 – Alternative Location Within the Owned 7145 Acre Parcel*

The first alternative is a similar project description as this petition, but with the concentrator, tailings and supporting infrastructure located at an alternative location within Wolfden's 7145-acre parcel of land. The proposed Alternative 1 location is Northwest of the base case and to the West of Pleasant Lake. Alternative locations for the 120-acre site are limited due to the presence of waterbodies, wetlands and steep slopes.



Figure 2-26: Alternative 1- Wolfden Parcel Site Location

Economics:

The economics of Alternative 1 are still positive however, with an impact to project operating costs. As noted in the table below, the operating cost for mining, which includes the cost to haul material over land from the portal to the mill feed storage pad, is higher as a result of the additional distance between project components. It is noted that an additional water treatment and water management system will be required for alternative 1 in order to manage water from two independent sites however, for the purposes of this evaluation, the operating cost is considered equal due to an assumed equivalent volume of water treated.

Project Operating Costs	
<u>Underground Mining (\$/t)</u>	<u>\$50.73</u>
<u>Processing (\$/t)</u>	<u>\$31.25</u>
<u>Dry Stack Placement of Tailings (\$/t)</u>	<u>\$1.30</u>
<u>Surface Services (\$/t)</u>	<u>\$2.31</u>
<u>General and Administration (\$/t)</u>	<u>\$7.69</u>
<u>Environmental and Sustainable Development (\$/t)</u>	<u>\$2.10</u>
<u>Total</u>	<u>\$95.39</u>

Costs related to hauling the ore material to another location on the Wolfden owned property was estimated to be 3\$/t ore based on extrapolation of haulage pricing supplied by Sargent Corporation and is shown in **Exhibit 2 -Attachment B - Sargent Corporation Indicative Pricing Revised .**

Socio Economics:

The socio economics impacts in Alternative 1 are also positive and significant when compared to other businesses in the region. Given that the project proposal is much the same as the base case, the socio economics are unlikely to change by large amount.

Soils:

The soils here are dominated by Bangor stony silt loam soil on gentler to moderate slopes. Bangor very stony silt loam, 0-8% slopes (BNB) make up about 50 acres, and Bangor very stony silt loam, 8-15% slopes cover about 68 acres, with Thorndike series on moderate to steep slopes making up the rest.

Bangor soil series are deep well drained soils formed in glacial till. The textures are silt loam to loam and slopes on both map units are gentle to moderate. The Hydrological soil group is B. The Bangor soils are generally suitable for development and present few limitations. There is no evidence that the soils are an improvement relative to the base case.

Slopes: Areas with gently to moderate slopes would be suitable locations. This includes both the B and C map units.

Stoniness: The stoniness is not considered limiting for this use.

Soil Drainage Class: The Bangor soils are well drained with inclusion of moderately well drained soils. This drainage class are generally suitable for most development. Bangor soils are better drained than the Dixmont soils that make up the majority of the NRCS map units in the Base Case site. The finer textures would be subject to erosion but are consistent with the soil's textures at the base case site.

Wetlands and Water:

Based on the NWI maps, there are small areas of mapped forested and scrub shrub wetlands along the eastern boundary. The Preferred Alternative does not have any mapped NWI wetlands, but site-specific delineations identified areas of wetlands and streams. Based on the concave topography and topographically inferred drainages it is likely there are areas of forested wetland and intermittent streams in the eastern area of Alternative 1 that are not shown on the NWI maps.

Viewshed Impact:

Given that the suggested Alternative 1 location is within the valley to the west of Pleasant Lake, it is anticipated that the viewshed impact would be similar to that of the base case resulting in two potential viewpoints along the front edge and the summit of Mount Chase.

Recreational Uses:

The Alternative 1 location is sitting directly adjacent to an active ATV/Snowmobile trail. Regardless, the project would minimize impact to the trail system and its users through relocation of impacted trails. Outside of the proposed rezoned boundary, access for traditional recreational activities, including ATV and snowmobile trail connectivity will remain intact.

Summary:

Alternative 1 appears to have potentially suitable conditions, within or adjacent to the subject area, based solely on desktop review of published data mapping. However; based on the presence of NWI mapped wetlands along the eastern boundary and the likely presence of intermittent streams in drainage channels that can be inferred from topographic contours that appear to drain into these wetlands. It is likely there are additional wetlands and other constraints that a site-specific wetland and soils survey would reveal. In addition, the increase Ore haulage distance increases both the capital and operating costs while increase

logistical risk related to overland handling of sulfide material. A report by Atlantic Resource Co. LLC was completed evaluating alternative 1 with respect to soils, wetlands, topography and wildlife habitats and can be found in **Attachment B – Wolfden Alternatives August 2021**.

2.4.1.2.3 Alternative 2 – Alternative Location Within Maine

The second alternative reviewed is an off-site location at the former Great Northern Paper mill in Millinocket, Maine, currently operated by Our Katahdin development group. The site is located approximately 52 miles by road and 32 miles southwest of the Pickett Mountain Mine site. The Our Katahdin site is located south of the former mill site on a wooded area approximately 0.5 miles west of the Penobscot River. An approximately 300 acre area was reviewed for siting the processing, tailings management and auxiliary components of the project. The Our Katahdin site is in an organized territory and is currently zoned for industrial use. This option would result in increased traffic and specifically, increased traffic in more densely populated areas.

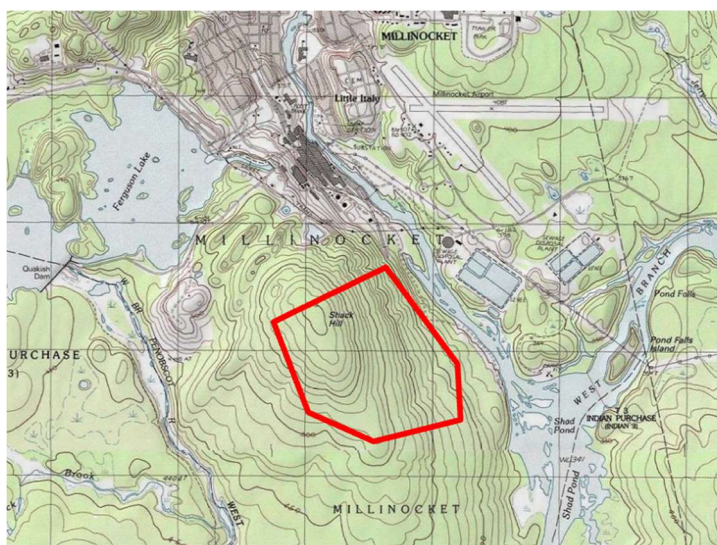


Figure 2-27: Alternative 2 - Our Katahdin Millinocket Industrial Site

Economics:

The economics of Alternative 2 are positive however, with a significant increase to project operating costs. As noted in the table below, the operating cost for mining, which includes the cost to haul material over land from the portal to the mill feed storage pad, is higher as a result of the additional distance between project components. It is noted that an additional water treatment and water management system will be required for Alternative 2 in order to manage water from two independent sites however, for the purposes of this evaluation, the operating cost is considered equal due to an assumed equivalent volume of water treated.

<u>Project Operating Costs</u>	
<u>Underground Mining (\$/t)</u>	<u>\$102.33</u>
<u>Processing (\$/t)</u>	<u>\$31.25</u>
<u>Dry Stack Placement of Tailings (\$/t)</u>	<u>\$1.30</u>
<u>Surface Services (\$/t)</u>	<u>\$2.31</u>
<u>General and Administration (\$/t)</u>	<u>\$7.69</u>
<u>Environmental and Sustainable Development (\$/t)</u>	<u>\$2.10</u>

Total	\$146.99
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Costs related to hauling the ore material to another location outside of Wolfden's property, up to 149 miles away is 54.6\$/t ore based on haulage pricing supplied by Sargent Corporation and is shown in **Attachment B - Sargent Corporation Indicative Pricing Revised.**

Socio Economics:

The socio economics impacts in Alternative 2 are also positive and significant when compared to other businesses in the region. Given that the project proposal is much the same as the base case aside from significant haulage to the Millinocket site, the socio economics will to improve relative to the base case.

Soils:

Alternative 2 site contains a mix of soils and parent material on a range of slopes. The western section contains approximately 85 acres of suitable Plaisted and Howland soil series on moderate slopes. Plaisted very stony loam, 5-15% slopes make up about 60 acres, with Howland very stony loam making up about 25 acres. Thorndike silt loams on moderate slopes (TvC) occupy about 30 acres in the southwest area. These soils are moderately shallow to bedrock with ledge at 10" to 20".

Slopes: Areas with moderate slopes would be generally suitable locations. This includes both the C map units. The areas along the eastern half are dominated by steeper slopes mapped as D slopes with Rockland strongly sloping and Plaisted 15-45% slopes. These areas would be generally unsuitable due to steepness and shallow bedrock conditions.

Stoniness: The stoniness is not considered limiting for this use.

Soil Drainage Class: The Plaisted soils are well drained, Howland soils are moderately well drained. This drainage class are generally suitable for development.

Bedrock: Thorndike soils would be shallow to ledge with limited suitability for development without blasting or building from existing ground surface. The shallow ledge conditions here are similar to some of the area on the preferred site on Wolfden property where the pads, buildings, ponds and tailings management facilities will be constructed from existing ground surface with the importation of soils.

Wetlands and Water:

Based on the NWI maps, there are no areas of mapped forested and scrub shrub wetlands on the site.

Viewshed Impact:

The Alternative 2 location is located on a hill within line of site of Mount Katahdin. However, the area is brownfield and already contains significant industrial uses that currently potentially impact the viewshed from Mount Katahdin. The proposed location is on the east side of the topographic relief and therefore could be sheltered from view from Mount Katahdin. Overall, the relative visual impact to recreational activities around Mount Katahdin in negligible due to the location of the proposed site and the current industrial use of the property surrounding it.

Recreational Uses:

The Alternative 2 location is within previously used industrial areas that is managed by Our Katahdin. The location is zoned for industrial use and no recreation resources occur on the proposed site. Traffic into

Baxter State Park travels through Millinocket and therefore will travel close to the proposed site; however the site location is far enough removed from travel routes that it is not anticipated to impact those travelers.

Summary:

Alternative 2 contains areas of suitable and limited suitability soils that may be used for the processing facility. Alternative 2 appears to have potentially suitable conditions, within or west of the subject area, based solely on desktop review of published data mapping. Recreational uses and viewshed impacts are anticipated to be negligible relative to its current state. The economics of a distant concentrator location relative to Pickett Mountain are significantly higher due to haulage distance and cost. A report by Atlantic Resource Co. LLC was completed evaluating alternative 2 with respect to soils, wetlands, topography and wildlife habitats and can be found in **Attachment B – Wolfden Alternatives August 2021.**

2.4.1.2.4 Alternative 3 – Alternative Location in New Brunswick

Alternative 3 is to remove concentrator, tailings and supporting infrastructure completely from the Pickett Mountain site in Maine and transport all of the ore material across the border into New Brunswick, Canada. This option would result in significant reduction in socio economic output, increased traffic and specifically, increased traffic in more densely populated areas while removing the storage requirement for tailings from Maine.

Economics:

The economics of Alternative 3 are still positive however, with a significant increase to project operating costs. As noted in the table below, the operating cost for mining, which includes the cost to haul material over land from the portal to the mill feed storage pad, is high as a result of the additional distance between project components.

<u>Project Operating Costs</u>	
<u>Underground Mining (\$/t)</u>	<u>\$117.73</u>
<u>Processing (\$/t)</u>	<u>\$45.00</u>
<u>Dry Stack Placement of Tailings (\$/t)</u>	<u>\$5.00</u>
<u>Surface Services (\$/t)</u>	<u>\$2.31</u>
<u>General and Administration (\$/t)</u>	<u>\$7.69</u>
<u>Environmental and Sustainable Development (\$/t)</u>	<u>\$2.10</u>
<u>Total</u>	<u>\$179.84</u>

Socio Economics:

The socio economics impacts in Alternative 3 are also positive but less significant when compared to the base case. A significant portion of the project expenses are removed from Maine in this alternative and result in a significant reduction in jobs as well as economic injection.

Soils:

The proposed location in New Brunswick is a brown field site with previous mining and industrial use therefore, soils are anticipated to be sufficient for continued use.

Wetlands and Water:

No additional impact to wetlands and water are anticipated in addition to the current activities taking place at the proposed site location.

2.5 Preliminary Plan for General Location and Timing of Project Elements

Figure 2-1 provides details related to general locations of buildings and facilities for the proposed project and **Table 2-1** provides a schedule for timing of the 4 project elements which are broken down into four phases is shown in the following chart.

Year	Years from Mining Permit Approval												
	-2	-1	0	1	2	3	4	5	6	7	8	9	10
Permitting Phase													
Conceptual Plan													
Rezoning Petition Submission													
Dialogue with Commission													
Approval of Rezoning													
Mining Application Initiated													
Baseline Study Work Proposal													
Baseline Study Work Approval													
Baseline Study Work Execution													
Mining Application Final Submission													
Mining Permit Approval													
Construction Phase													
Removal of trees and grub the land.													
Construction of roadways and working areas													
Construction of mineralized and waste rock pads.													
Installation of Temporary Power Generation.													
Installation of temporary explosives magazines (Rental from supplier).													
Installation of ground and surface water monitoring locations.													
Installation of air monitoring systems.													
Construction of the water management ponds and discharge structures.													
Construction of the water treatment facility.													
Construction of temporary shop facility.													
Excavation of the mine portal and services													
Begin mining development.													
Excavation of ventilation raise to surface.													
Installation of potable water system.													
Installation of security infrastructure.													
Installation of mine offices and dry facility.													
Installation of warehouse and laydown area.													
Installation of electrical substation													
Tie in electrical infrastructure grid													
Construction of TMF stage 1													
Construction of TMF stage 2													
Construction of TMF stage 3													
Construction of Concentrator and supporting facilities.													
Construction of permanent shop facility.													
Operations Phase													
Mine Development													
Mine Production Ramp Up													
Commercial Production													
Production Ramp Down													
Mine Closure													
Reclamation Phase													
Decommissioning of site buildings													
Site final cleanup and contouring													
Capping and closure of tailings facility													
Spread stored overburden and capping material on impacted sites													
Construction of underground blockages (Plugs)													
Removal of Pond and storage pad infrastructure													
Operation of water treatment facility													
Removal of water treatment facility													
Ground and surface water monitoring program													

Table 2-5: High Level Project Schedule of Mine Permitting, Construction, Operation and Reclamation

regraded surface as final soil cover and seeded/mulched to support natural growth of vegetation. Openings to surface from underground that are non-essential will be plugged and capped with engineered concrete or steel plugs to ensure future access cannot happen either purposefully or accidentally. All precipitation that contacts these locations will continue to be collected and monitored for water quality and treated before being discharged. After removal of all class 3 structures, it is anticipated that water quality of run-off being collected and treated will already begin to improve.

Only Class 1 structures (TMF) will remain in place into perpetuity. Concurrently with the placement of tailings on the TMF, the TMF will be reclaimed through progressive capping and revegetating during the life of the operation, and not just at the end of operations. Therefore, the final reclamation stage will be to cover the final TMF cell with an engineered cap of permeability similar to the bottom liner. After it is capped and contoured to support precipitation drainage, the TMF will be covered with a final soil layer using the remaining material from the overburden storage areas. This will support regrowth of natural vegetation and long term, permanent erosion control. Precipitation that falls on the TMF will drain off around the perimeter of the facility. The restoration design will include appropriately sized and constructed drainage features to handle storm events, consistent with MDEP's stormwater management requirements. With all the Class 1 and Class 3 structures being closed or removed, the remaining site features will not adversely impact the water quality of run-off that is being collected and treated prior to discharge. After roughly 1 year post closure, it is anticipated that the drainage water from site will be back to historical quality and no longer require treatment. After this has been confirmed, and has been approved by the MDEP, Wolfden will decommission, remove and sell the water management facility. The water management facility will be excavated, and inert material placed underground, and residual demolition debris collected and transported to an appropriately licensed disposal facility. Finally, the area will be recontoured to match historical topography. A final engineered plug will be placed in the portal area to completely and permanently block access to any underground workings by humans.

Once final reclamation work is completed, continued post-closure monitoring of surface water and groundwater will take place for a duration that is specified in the MDEP mining permit. Within the first year, samples will be taken frequently, following the sampling requirements established for operating the property. In following years, sampling intervals will decrease, if supported by long term monitoring data and upon approval from MDEP, as the confidence in the quality of closure increases. This will continue for an estimated 5 years until the sampling frequency is minimized to an agreed upon frequency based on an approved post closure monitoring plan and in consultation with MDEP. The frequency of monitoring will be established and evaluated statistically based on water quality trends and data.

The property will then be rezoned. Land use restrictions and deed covenants will be instituted over land occupied by the tailings facility to ensure that no industrial or commercial activity occurs over that portion of the site post closure.

Beneficial re-use of the property will include timber harvesting as it occurs presently outside the tailings facility footprint and may include continued solar power generation if installed during mining operations. Also, the portal can be closed in a manner that will allow entry underground to bats, providing valuable habitat (based on an approved plan with DEP). Recreational uses will be allowed to continue on the property including fishing, hunting, hiking, ATV's, etc. Restriction would be placed on the tailings facility in order to protect that area from damage by off road vehicles. In order to ensure protection of the tailing's facility area, a series of permanent signs will be posted around the perimeter restricting access to authorized personnel only. In addition, if any future transfer of land ownership were to take place, the deed within the tailings area would restrict the use of heavy equipment or any small vehicles and recreational vehicles to ensure that damage to the tailings cover is mitigated.

Wolfden Mt. Chase LLC

Exhibit 2: Attachment A - Figures

Exhibit 2 Figures Include:

Figure 2-1 Preliminary Site Plan (Previously Exhibit D-2)

Figure 2-2 Grading Layout

Figure 2-3 Grading and Cross Section Layout

Figure 2-4 Cross Sections Layout 1

Figure 2-5 Cross Sections Layout 2

Figure 2-6 Details Layout 1

Figure 2-22 Existing Conditions and Water Bodies

Figure 2-23 Site Layout Option 1

Figure 2-24 Site Layout Option 2

Figure 2-25 Site Layout Option 3

Wolfden Mt. Chase LLC

Exhibit 2: Attachment B - Reports

Exhibit 2 Supporting Documents Include:

Pine Tree Waste Management - Pine Tree Waste Services Waste Removal Proposal

RPC Report on ABA

SLR Wolfden TSF Supplemental (5 June 2021)

Sargent Corporation Indicative Pricing Revised with Quarry Proposal

Attachment B – Ground Ore Characterization Dewatering, Rheology, Testing Campaign

SLR Wolfden TSF Failure Modes (5 June 2021)

Atlantic Resource Co. LLC– Wolfden Alternatives August 2021.

Wolfdon Mt. Chase LLC

EXHIBIT 3 – DEED, LEASE, SALES CONTRACT, OR EASEMENT

3 DEED, LEASE, SALES CONTRACT, OR EASEMENT

3.1 Current Use of Property

How has your property been used over the past ten years?		
<input type="checkbox"/> Residential	<input type="checkbox"/> Residential with home	<input type="checkbox"/> Commercial or industrial
<input checked="" type="checkbox"/> Undeveloped / Forestry	<input type="checkbox"/> Public or institutional	<input type="checkbox"/> Other: _____

3.2 Legal Description and Delineation of the Property Boundaries Proposed for Redistricting

A certain piece or parcel of land located within township 6, range 6 wells (t6, r6 wells), county of Penobscot, state of Maine and being more particularly bounded and described as follows:

Beginning at a point located in the Maine state plane coordinate system-nad 83 (east zone-1801), as measured in united states survey feet at north: 898544.15, east: 994010.57; thence running through the land of the grantor on a course of north ninety degrees zero minutes zero seconds west (s 90° 00' 00" w) a distance of four thousand one hundred ninety-four and three tenths (4194.3) feet to a point located at north 898544.15, east 989816.27;

Thence running through the land of the grantor on a course of north zero degrees zero minutes zero seconds east (n 0° 00' 00" e) a distance of five thousand one hundred twenty-five and forty-six hundredths (5125.46) feet to a point located at north 903669.61, east 989816.27;

Thence running through the land of the grantor on a course of north eighty-nine degrees fifty-nine minutes eighteen hundredths' seconds east (n 89° 59' 00.18" e) a distance of six thousand one hundred eleven and forty-nine hundredths (6111.49) feet to a point located at north 9036711.38, east 995927.76;

Thence running through the land of the grantor on a course of south zero degrees zero minutes zero seconds east (s 0° 00' 00" e) a distance of two thousand three hundred seventy and nineteen hundredths (2370.19) feet to a point located at north 901301.19, east 995927.76;

Thence running through the land of the grantor on a course of south ninety degrees zero minutes zero seconds west (s 90° 00' 00" w) a distance of three hundred ninety-eight and one hundredths (398.01) feet to a point located at north 901301.19, east 995529.75;

Thence running through the land of the grantor on a course of south twenty-eight degrees fifty-one minutes twenty and thirty-seven hundredths' seconds west (s 28° 51' 20.37" w) a distance of three thousand one hundred forty-seven and eighty-eight hundredths (3147.88) feet to the aforementioned point of beginning.

Said parcel contains five hundred twenty-eight and twenty-three hundredths (645.96) acres more or less

The above-described parcel is a portion of land owned by the grantor as described in book 14672, page 27 Of the Penobscot registry of deeds located in Bangor, Maine.

A map of the above description is shown below in **Figure 3-1: Area Proposed for Rezoning.**

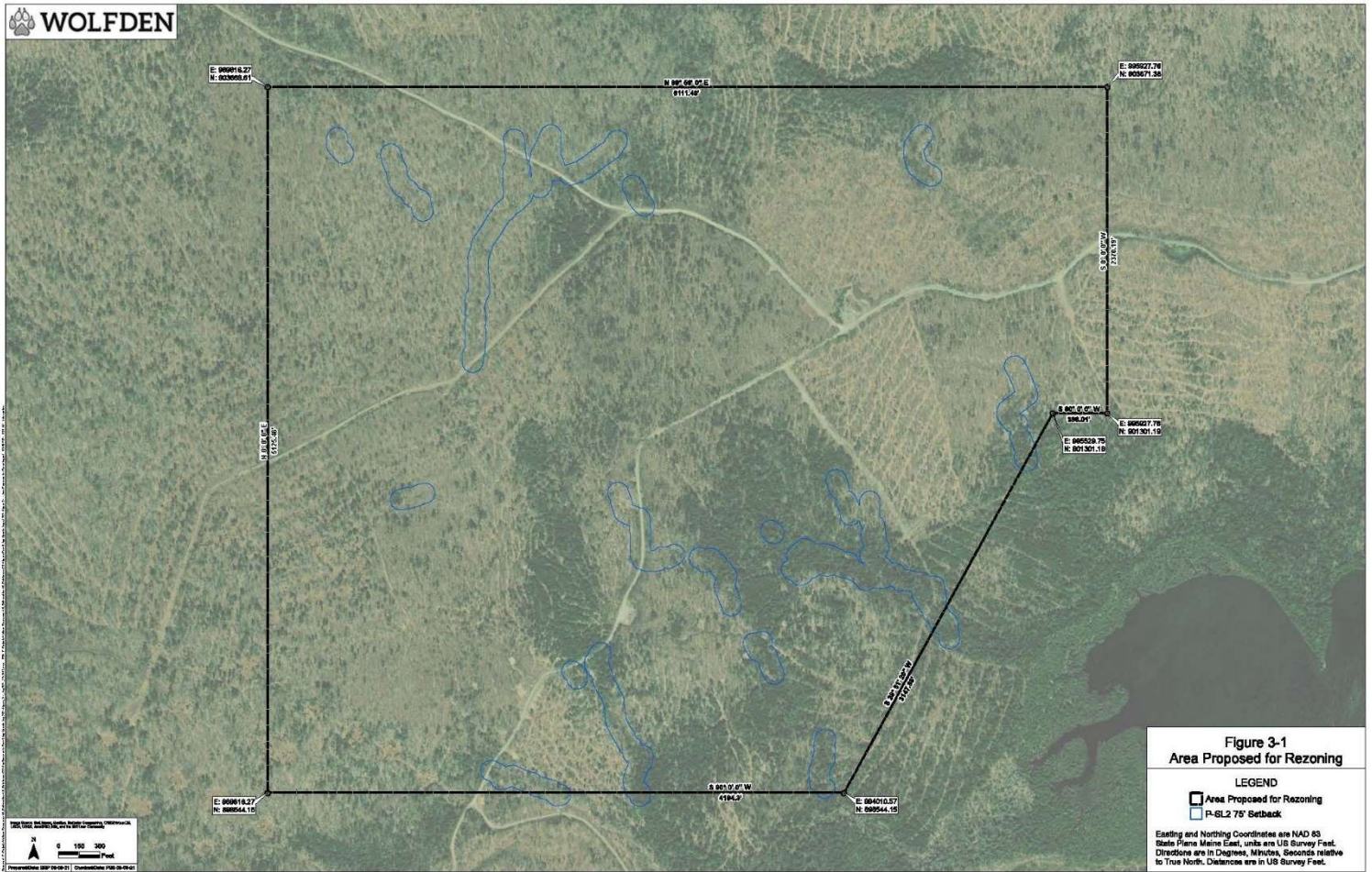


Figure 3-1: Area Proposal for Rezoning

Wolfden Mt. Chase LLC

EXHIBIT 4 – NOTICE OF FILING

4 NOTICE OF FILING

NOTICE OF FILING OF APPLICATION WITH THE MAINE LAND USE PLANNING COMMISSION

Concurrently with filing an application with the Maine Land Use Planning Commission, the applicant must send by certified mail a completed copy of this notice to: all persons owning or leasing property within 1,000 feet of the area proposed to be rezoned; co-owners and co-lessors that are not co-applicants; the landowner(s) (if applicant is a lessee); plantation assessors or town select board; and county commissioners.

This is to notify you that Wolfdon Mt Chase LLC _____
(name and address of applicant)

has filed an application for a zone change with the Maine Land Use Planning Commission, pursuant to provisions of 12 M.R.S. Section 685-A(8-A) and the Commission's rule Chapter 10, Land Use Districts and

Standards, to rezone 600.1 acres of land located in T6R6 WELS Penobscot County, Maine from its present M-GN General Management Subdistrict designation to a D-PD Planned Development Subdistrict for the purposes of construction, operation and closure/remediation of an underground metallic mineral mine, concentrator and support infrastructure. _____
(general description of proposed activity, use, and acreage)

located in T6R6 WELS, Penobscot County _____.
(name of town, township, or plantation, and county)

The application will be filed for public inspection at the Maine Land Use Planning Commission office circled below (circle the appropriate office) on August 31/2021 _____.
(specify the date that this application will be filed with the LUPC).

AUGUSTA OFFICE		EAST MILLINOCKET OFFICE	
18 Elkins Lane - Harlow Bldg.	191 Main Street	Serving southern Penobscot and Aroostook Counties, and portions of Piscataquis and northern Washington Counties	
22 State House Station	East Millinocket, ME	Tel. (207) 485-8354	Tel. (207) 399-2176
Augusta, ME 04333-0022	04430	FAX (207) 287-7439	

Written comments and requests for a public hearing should be sent to the Maine Land Use Planning Commission at the address circled above and **must be submitted in a timely manner**. The Commission prefers that all written comments and requests for a public hearing be submitted within 20 days of the date an application is accepted for processing. Requests for a public hearing must clearly state the reason(s) a public hearing is warranted on this project.

For questions about submitting written comments, requesting a public hearing, or for any additional information, contact Commission staff at the office circled above.

The Land Use Planning Commission's legal authority is established by 12 M.R.S. Section 683-A.

4.1 Names and Addresses of Property Owners Located Within 1,000 feet of the Wolfden Property

No properties are located within 1,000 feet of the area proposed for rezoning.

Please see **Exhibit 5 Attachment A** for property locations.

ABUTTING LANDOWNER OR LEASE ADDRESSES ARE AS FOLLOWS:

RYAN R. ALLEN

8 KNOTTA WAY

NAPLES, MAINE 04055

AROOSTOOK TIMBERLANDS, LLC.

P.O. BOX 5777

SAINT JOHN, NEW BRUNSWICK

E2L 4M3, CANADA

CASSIDY TIMBERLANDS, LLC

C/O BENJAMIN D. CARLISLE

P.O. BOX 637

BANGOR, MAINE 04402 0637

RAYMOND & JEANETTE GALLAGHER

P.O. BOX 478

PATTEN, MAINE 04765

GARDNER LAND COMPANY, INC

NICKOLAS IRELAND

P.O. BOX 189

LINCOLN, MAINE 04457

HERBERT C. HAYNES, INC.

C/O GINGER MAXWELL

P.O. BOX 96

WINN, MAINE 04495

LAKEVILLE SHORES, INC.

C/O GINGER MAXWELL

P.O. BOX 96

WINN, MAINE 04495

BERT S. LORD

(POSSIBLY)

131 WILEY ROAD

LITTLETON, MAINE 04730-6508

DAVID PORTER

131E NEWPORT ROAD

STETSON, MAINE 04488

RAYE & KATHY PORTER

131 EAST NEWPORT ROAD

STETSON, MAINE 04488

KYLE & JON WESCOTT

191 LOCATION ROAD

BELGRADE, MAINE 04917

5. ~~ACREAGE.~~ ~~Specify the acreage proposed for rezoning under "Acres to be Developed." If your petition to rezone is intended for subsequent subdivision, specify the acreage proposed to be retained by the petitioner under "Retained"~~STANLEY GRASS JR.

80 BEECH GROVE ROAD

CORINTH, ME 04427

Wolfden Mt. Chase LLC

EXHIBIT 5 – LAND DIVISION HISTORY

5 LAND DIVISION HISTORY

Maps of the existing property Chain of Title as well as a map of the proposed rezoning boundary shown are shown in **Attachment A - Figures 5-1 and 5-2.**

Wolfden Mt. Chase LLC

Exhibit 5: Attachment A - Figures

Exhibit 5 Figures Include:

Figure 5-1 – Wolfden Property Map

Figure 5-2 – Wolfden Property Map D-PD

Wolfden Mt. Chase LLC

EXHIBIT 6 – STRUCTURES, FEATURES, AND USES

6 STRUCTURES, FEATURES, AND USES

Site Conditions

The following table describes Acres." Specify the total amount of contiguous land area that is owned or leased by the petitioner within the township, town or plantation of the project area under "Total Contiguous Acres." "Total Contiguous Acres" should equal the sum of "Acres to be Developed" and "Retained Acres."

Acres to be Rezoned / Developed: 528.2	Acres to retain current zoning: 6,616.8	Total Contiguous Acres: 7,145 (by Deed)
---	--	--

6. SITE CONDITIONS. Describe in detail the present condition of your property and areas to be rezoned, including the nature of any water frontage (rocky, sandy, wooded, cleared, etc.); the general slope and topography of the ground (flat, steep, percent slope, etc.); existing vegetation; the history of vegetation clearing and timber harvesting activities; hydrologic features, including whether portions of the site are subject to flooding or ponding; special natural features, such as rare or unique plants or plant communities; and other natural and cultural conditions. These features are discussed in additional detail in Exhibits 10,15,22,24 and 25.

Water Frontage: The area proposed for rezoning does not have water frontage. -The area proposed to be rezoned is approximately ~~7.39~~9% of the total property. -The balance of the Wolfden property (outside the area proposed for rezoning) includes Pleasant Lake and the western portions of Mud Lake and Pickett Mountain Pond. -The water frontage of Pickett Mountain Pond is approximately 17,300 feet and wooded including adjacent areas outside of the Wolfden property. Combined Pleasant and Mud Lakes have a frontage of approximately 48,860 feet and are wooded including eastern Mud Lake which is outside the Wolfden parcel.

Slope and Topography: Topography within the area proposed for rezoning ~~is gently~~has variable sloping where development is proposed. -Minimum slopes of ~~2%0.02~~ feet/ feet to maximum slopes of 15%. ~~TMF0.04 feet/ feet (2% 4%).~~ Area proposed is along a broad and relatively flat upland ridge. The Main pad area slope range up to 15%. The remainder of the Wolfden property has a wide range of topographic conditions from flat lying forested and wetland areas around the previously mentioned lakes and streams, to a series of moderate mountain peaks, including Pickett Mountain to the south (el. 1,753- feet), a prominent ridge line in middle of the property (maximum el. 1,330 feet), to a series of unnamed ridges north of Pleasant Lake ranging from 1,146 -feet to 1,100 -feet. The steepest hill slopes are around Pickett Mountain which rises approximately 710 feet above Pickett Mountain Pond at an average slope of 0.3 -feet/ feet.

Existing Vegetation: The area proposed for rezoning is primarily upland forested habitat, co-dominated by deciduous trees (i.e., beech, birch, and red maple trees) and coniferous trees (i.e., spruce, fir, cedar and hemlock). -The area has been logged in the past and is currently in vegetative re-growth, while part of the area may be harvested during the development of the operation. -It is presumed the forest habitat of the balance of the Wolfden property is dominated by similar deciduous and coniferous tree species.

Hydrologic Features: The area proposed for rezoning contains at streams associated with forested wetlands and vernal pools that have been mapped and characterized. -The Wolfden property includes lakes, ponds, and streams, including Pleasant Lake, Pickett Mountain Pond, Mud Pond, and West Branch of the Mattawamkeag River. -Depth to groundwater is shallow, where observed and intermittent stream features are present as discussed further below. Groundwater hydrology has not been formally characterized. -A moderate yield sand and gravel aquifer has been mapped on the northern side of Pleasant Lake.

Wetlands: During site reconnaissance within the area proposed for rezoning, wetlands, potential vernal pools, and intermittent streams were observed. -A detailed wetland and vernal pool survey was conducted during the growing season and amphibian breeding season in Spring of 2020. -A report of the findings is presented in **Exhibit D**. ~~The final design permitted by DEP will be able to impacts to these resources and but would mitigate unavoidable impacts should they be necessary.~~ **10.** Within the balance of the Wolfden property, NWI mapped forested wetland and scrub-shrub wetlands are present surrounding drainages and streams associated with the lakes and ponds. -Wetlands of

Special Natural Areas: Special natural areas have not been observed during site reconnaissance and the Maine Natural Area Program (MNAP) has prepared an environmental site review and identified no rare botanical features in the project area based on available data. -Wolfden will work with the MNAP to document RTE and exemplary botanical features as part of the baseline study under MEDEP Chapter 200 rules.

Natural and Cultural Conditions: A Phase 0 archeological survey was conducted in the Spring of 2020. -The scope of the survey has been developed in consultation with the MHPC to identify the potential presence of historic or prehistoric cultural features. -Results are presented in **Exhibit M**. **24.**

~~3~~ **7. CURRENT USE OF PROPERTY.**

How has your property been used over the past ten years?

- ☐ Residential
 ☐ Residential with home occupation
 ☐ Commercial or industrial
☒ Undeveloped / Forestry
 ☐ Public or institutional
 ☐ Other: _____

~~8. EXISTING STRUCTURES AND DEVELOPMENT.~~ Please list

6.1 Existing Structures and Development

The following table lists any structures or development on your property, such as roads, residences, accessory structures, driveways, trails and/or other uses.

Type of use or structure (dwelling, garage, driveway, commercial, recreation, etc.) Type of Structure and Use (specify if temporary)	Year built Duration in Place if Temporary (specify days or months)	Exterior dimensions (in feet) (LxWxH) <i>Current</i> Exterior Dimensions (LxWxH) in ft	Type of foundation (full basement, slab, post, etc.) <i>Proposed</i> Exterior Dimensions (LxWxH) in ft	Distance (in feet) of structure from nearest:					
				Road	Property line	Lake or pond	River or stream	Wetland	Ocean/Coastal Wetland
<u>Existing Structures</u>									
-Gravel Logging Roads	UNK	-Various							
-No other existing structures									

<u>Proposed Structures</u>										

9. ~~PETITIONS TO REZONE TO A MANAGEMENT OR PROTECTION SUBDISTRICT.~~

~~If your petition proposes to rezone to a Management or Protection Subdistrict please complete item 9; If NOT, continue to item 10.~~

~~Describe how the proposed new subdistrict designation is more appropriate for the protection and management of existing uses and resources within the affected area.~~

~~A map of the existing conditions relative to the proposed boundary are identified in **Figure 6-1 (Exhibit 6 – Attachment A)**. In addition, surficial and bedrock geology maps are shown in **Figure 6-2** and **Figure 6-3 (Exhibit 6 – Attachment A)**.~~

Wolfden Mt. Chase LLC

Exhibit 6: Attachment A - Figures

Exhibit 6 Figures Include:

Figure 6-1: Existing Conditions

Figure 6-2: Surficial Geologic Units

Figure 6-3: Bedrock Geologic Units

Wolfden Mt. Chase LLC

EXHIBIT 7 – SITE PLANS

7 SITE PLANS

7.1 Existing Site Plan

The Preliminary Site Plan and existing conditions of the proposed project are shown in **Figure 2-1** and **Figure 6-1** respectively. The site plan includes a series of proposed site facilities (buildings, structures, pads, ponds, etc.). The following **Table 7-1** indicates the title, area and height of each of the proposed facilities. Each facility is also given an identifier of Building, Lined Pad or Impervious Area. For the purposes of this Exhibit a building is any erected structure built out of steel, wood, concrete or other building construction materials and includes facilities such as office buildings, concentrator, maintenance shop, etc. A lined pad is any surface that is lined with an engineered material such as clay, rubber or polyethylene and includes facilities such as the dry stack tailings facility, water storage ponds and mill feed pad, etc. Impervious areas include all buildings, and lined pads, as well as other structures that do not have engineered covers such as the parking areas, roads and laydown storage. The impacted areas include all of the impervious areas, as well as any site buried structures, and existing ground structures. Buried structures include the proposed infiltration galleries and a septic field, and the existing ground structure is a storage location for organic material.

The total estimated impacted area is 122 acres with 41% of that being the tailings facility footprint.

Table 7-1 Development Plan

Not Applicable

10. FLOOD AREA ZONING

See page ii of the instructions for additional information for, and explanation of, each question.

- a. Is any portion of the area proposed for rezoning located within: i) a mapped P-FP (Flood Prone Area Protection) Subdistrict, ii) a mapped FEMA (Federal Emergency Management Agency) flood zone, or iii) an unmapped area prone to flooding? ☐ YES ☒ NO

If you are unsure whether your property is in a mapped P-FP Subdistrict contact the LUPC office that serves your area or review the official zoning map. If you are unsure whether your property is in a mapped FEMA flood zone, first check whether your property is in one of the townships listed on page ii of the instructions and, if so, contact the LUPC office that serves your area.

If you answer NO to 10.a, above, go to Section 11.

If you answer YES to 10.a, above, please continue to items 10.b through d. Note that more than one of the following may apply.

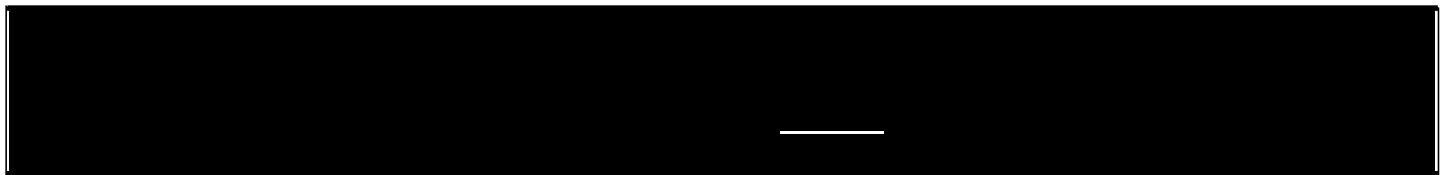
- Note, if this petition proposes to leave unchanged the P-FP or mapped FEMA flood zone, yet proposes to add or change other zoning designations, be aware that in the P-FP Subdistrict:
- some uses may require specific limitations or design requirements; or
 - subsequent permitting procedures may require that you hire a licensed land surveyor, engineer or architect who is authorized to certify elevation information.

<u>Name</u>	<u>ID</u>	<u>Square Footage</u>	<u>Height (ft)</u>	<u>Area</u> <u>ge</u>	<u>Structure Type</u>
<u>Temporary Explosives Magazine</u>	<u>1</u>	<u>1,077</u>	<u>8</u>	<u>0.02</u>	<u>Building</u>
<u>Temporary Explosives Magazine</u>	<u>2</u>	<u>1,077</u>	<u>8</u>	<u>0.02</u>	<u>Building</u>
<u>Ventilation Exhaust Raise</u>	<u>3</u>	<u>1,077</u>	<u>10</u>	<u>0.02</u>	<u>Building</u>
<u>Ventilation Exhaust Raise</u>	<u>4</u>	<u>1,077</u>	<u>10</u>	<u>0.02</u>	<u>Building</u>
Does this petition propose to <u>remove</u> any part of a mapped P-FP Subdistrict? _____ Does this petition propose to <u>affect</u> any areas in a mapped FEMA flood zone? _____ Does this petition propose to <u>add</u> a mapped P-FP Subdistrict? _____					
<u>b. c. d. Infiltration Gallery 1</u>	<u>5</u>	<u>246,135</u>	<u>-1 to 4</u>	<u>5.6</u>	<u>NO Buried Structure</u>
<u>Parking Facility</u>	<u>6</u>	<u>9,511</u>	<u>0</u>	<u>0.22</u>	<u>Impervious area</u>
<u>Equipment Parking</u>	<u>7</u>	<u>426,831</u>	<u>0</u>	<u>9.80</u>	<u>Impervious area</u>
<u>Proposed Site Road Infrastructure</u>	<u>8</u>	<u>167,650</u>	<u>0</u>	<u>3.85</u>	<u>Impervious area</u>
<u>Infiltration Gallery 2 Concentrator/Conc Handling</u>	<u>9</u>	<u>92,805</u>	<u>-1 to 4</u>	<u>2.13</u>	<u>Buried Structure</u>
<u>Tailings Management Facility</u>	<u>10</u>	<u>27,582</u>	<u>60</u>	<u>0.63</u>	<u>Building</u>
<u>Fuel Filling Station</u>	<u>11</u>	<u>2,197,987</u>	<u>22</u>	<u>50.46</u>	<u>Lined Pad</u>
<u>Electrical Substation</u>	<u>12</u>	<u>2,040</u>	<u>12</u>	<u>0.05</u>	<u>Building</u>
<u>Laydown Area</u>	<u>13</u>	<u>5,869</u>	<u>20</u>	<u>0.13</u>	<u>Building</u>
<u>Mill Feed Storage Pad</u>	<u>14</u>	<u>115,335</u>	<u>0</u>	<u>2.65</u>	<u>Impervious area</u>
<u>Hoist/Headframe</u>	<u>15</u>	<u>57,827</u>	<u>0</u>	<u>1.33</u>	<u>Lined Pad</u>
<u>Office Complex</u>	<u>16</u>	<u>1,077</u>	<u>80</u>	<u>0.02</u>	<u>Building</u>
<u>Infiltration Gallery 3</u>	<u>17</u>	<u>8,684</u>	<u>20</u>	<u>0.20</u>	<u>Building</u>
	<u>18</u>	<u>66,650</u>	<u>-1 to 4</u>	<u>1.53</u>	<u>Buried Structure</u>

<u>Infiltration Gallery 4</u>	<u>19</u>	<u>89,120</u>	<u>-1 to 4</u>	<u>2.05</u>	<u>Buried Structure</u>
<u>Infiltration Gallery 5</u>	<u>20</u>	<u>161,935</u>	<u>-1 to 4</u>	<u>3.72</u>	<u>Buried Structure</u>
<u>Infiltration Gallery 6</u>	<u>21</u>	<u>166,790</u>	<u>-1 to 4</u>	<u>3.83</u>	<u>Buried Structure</u>
<u>Subsurface Septic Waste Leachfield</u>	<u>22</u>	<u>2,800</u>	<u>-4</u>	<u>0.06</u>	<u>Buried Structure</u>
<u>Portal</u>	<u>23</u>	<u>16,736</u>	<u>-32</u>	<u>0.38</u>	<u>Impervious area</u>
<u>Shop</u>	<u>24</u>	<u>4,253</u>	<u>30</u>	<u>0.10</u>	<u>Building</u>
<u>Warehouse</u>	<u>25</u>	<u>3,432</u>	<u>30</u>	<u>0.08</u>	<u>Building</u>
<u>Waste Rock Storage Facility</u>	<u>26</u>	<u>164,034</u>	<u>30</u>	<u>3.77</u>	<u>Lined Pad</u>
<u>Pre-Treatment Water Storage Pond</u>	<u>27</u>	<u>154,640</u>	<u>10</u>	<u>3.55</u>	<u>Lined Pad</u>
<u>Water Treatment Facility</u>	<u>28</u>	<u>16,155</u>	<u>30</u>	<u>0.37</u>	<u>Building</u>
<u>Process Water Conditioner</u>	<u>29</u>	<u>12,243</u>	<u>20</u>	<u>0.28</u>	<u>Building</u>
<u>Low Grade Ore Pad</u>	<u>30</u>	<u>240,296</u>	<u>0</u>	<u>5.52</u>	<u>Lined Pad</u>
<u>Organics Storage</u>	<u>31</u>	<u>194,580</u>	<u>30</u>	<u>4.47</u>	<u>Existing Ground</u>
<u>North Tailings Water Collection Pond</u>	<u>32</u>	<u>121,380</u>	<u>6</u>	<u>2.79</u>	<u>Lined Pad</u>
<u>Concentrate Load Bld</u>	<u>33</u>	<u>800</u>	<u>20</u>	<u>0.02</u>	<u>Building</u>
<u>Security Bldg. w/Gate</u>	<u>34</u>	<u>200</u>	<u>10</u>	<u>0.00</u>	<u>Building</u>
<u>Post Treatment Water Storage Pond</u>	<u>35</u>	<u>84,942</u>	<u>10</u>	<u>1.95</u>	<u>Lined Pad</u>
<u>Backfill Plant</u>	<u>36</u>	<u>400</u>	<u>20</u>	<u>0.01</u>	<u>Building</u>
<u>Crushing Plant</u>	<u>37</u>	<u>1,600</u>	<u>20</u>	<u>0.04</u>	<u>Building</u>
<u>Concentrator Thickener Tanks</u>	<u>38</u>	<u>945</u>	<u>23</u>	<u>0.02</u>	<u>Building</u>
<u>Fine Ore Bin</u>	<u>39</u>	<u>315</u>	<u>40</u>	<u>0.01</u>	<u>Building</u>
<u>Raw Ore Conveyor Belt</u>	<u>40</u>	<u>3,000</u>	<u>10</u>	<u>0.07</u>	<u>Building</u>
<u>Infiltration Gallery 7</u>	<u>41</u>	<u>169,290</u>	<u>-1 to 4</u>	<u>3.89</u>	<u>Buried Structure</u>
<u>Infiltration Gallery 8</u>	<u>42</u>	<u>25,130</u>	<u>-1 to 4</u>	<u>0.58</u>	<u>Buried Structure</u>
<u>South Tailings Water Collection Pond</u>	<u>43</u>	<u>63,150</u>	<u>6</u>	<u>1.45</u>	<u>Lined Pad</u>
<u>Core Storage & Laydown Area</u>	<u>44</u>	<u>4,800</u>	<u>20</u>	<u>0.11</u>	<u>Building</u>

Existing Site Road Infrastructure	45	178,875	0	4.11	Impervious area
Fixed Gates	46	-	3.00	0.00	Building
Fire Water Pumphouse	47	400	10.00	0.01	Building
Power Generator Building	48	960	10.00	0.02	Building
Total Buildings Area	-	99,063	SQ FT	2.3	Acres
Total Lined Pads Area	-	3,084,256	SQ FT	70.8	Acres
Total Impervious Area	-	4,098,257	SQ FT	94.1	Acres
Total Impacted Area	-	5,312,132	SQ FT	122.0	Acres
Total Cleared Area	-	6,905,772	SQ FT	158.6	Acres

If you answer YES to 10 b, c, or d above, be sure to provide the necessary information as EXHIBIT E. See page v of the instructions for more detail regarding EXHIBIT E.



11. PUBLIC AND COMMUNITY SERVICES.

Service / feature	Name of provider / facility	Distance (in miles) from site:
Ambulance	Island Falls Ambulance Service	23
Education	RSU 89, (Stacyville, ME)	30 / 18.5
Fire	Island Falls Volunteer Fire Department	23
Police	Penobscot County Sherriff Dept. (Bangor) / Aroostook County Sheriff	90 / 45
Solid waste disposal (during construction: construction debris, stumps, brush, asphalt and pavement products)	Casella Waste Management (Houlton ME)	44
Solid waste disposal (after construction)	Same	
Public water supply (if)	NA	
Public wastewater (if)	NA	
Public road	State Highway Route 11	4.5
Service center	Houlton, ME	39
Electric utilities	Emera Maine (New power transmission line from Patten)	14.6
Phone/Internet utilities	Viasat Highspeed — Clearconnect (Satellite)	NA

Provide as EXHIBIT L, either: i) a letter from each service provider confirming the facility's availability and capacity to provide the necessary services to the proposed development; OR ii) only in cases where the rezoning is for legally existing development, provide notice of the rezoning proposal to each service provider and provide, as EXHIBIT L, proof of such notice. All zoning petitions intended for residential

development must submit such exhibits for education services, regardless whether the dwelling units are anticipated to be seasonal or year-round dwellings. See page vi of the instructions for more detail regarding this exhibit.

~~1~~ Public services, such as those identified above, are commonly provided by a municipality, or in the case of much of the unorganized territories, these services are provided or contracted for, by the county. In some cases, service centers may provide some of these public services. Service centers are identified by the Department of Agriculture, Conservation and Forestry's Municipal Planning Assistance Program. A partial listing of those near the Commission's jurisdiction includes: Ashland, Augusta, Bethel, Bingham, Brewer, Bridgeton, Calais, Caribou, Dexter, Dover-Foxcroft, Eastport, Ellsworth, Farmington, Fort Kent, Greenville, Guilford, Houlton, Jackman, Limestone, Lincoln, Machias, Madawaska, Mars Hill, Mexico, Milbridge, Millinocket, Newport, Norway, Orono, Pittsfield, Presque Isle, Rangeley, Rumford, Van Buren. For a more complete listing, check with the Municipal Planning Assistance Program at www.maine.gov/dacf/municipalplanning/index.shtml.

12. ACCESS TO SITE.

- a. Starting with the closest public road, then each successive road, provide the following information about each existing road that will be used to access the area proposed for rezoning.

Road name	Public or private? (if private, complete the rest of this row)	Owner name	Length and travel width of road	Right-of-way width	Type of wearing surface
See Appendix A Attachment J	Private	Wolden Mt. Chase LLC	5.1 mi /15 ft	NA	Gravel

- ~~1~~ If access to your site is limited as part of your deed, lease, easement or other covenants, be sure to include a copy of such restrictions or provisions as part of **EXHIBIT B**. See page iv of the instructions for more detail regarding this exhibit.

- b. Water Only Access—Not Applicable



13. SURROUNDING USES.

A. ~~Within one mile of the site, the area is forested and is currently in use for wood harvesting. In general, the area beyond one mile is surrounded by commercial forests. The site has been logged within the last 7 to 10 years and is in vegetative regrowth. Pickett Mountain Pond is within one mile of the site and Pleasant Lake (and nearby Mud Lake) are slightly beyond a mile. Maine Department of Inland Fisheries and Game surveys (1958 and 1953 respectively) indicate both are shallow mud bottom ponds with warm temperatures at all depths in summer months. The ponds did not have conditions supportive of cold water fish species at the time of these surveys, but inlet and outlet streams (West Branch of the Mattawamkeag River, Pickett Mountain Stream and Spring Brook) provided spawning and nursing areas for trout. The use of these ponds and streams for recreational use is not restricted. There are a small number of seasonal residences around Pleasant Lake. Two residences are located within 675 feet of the southern shore, and four residences are located along the northern shore within 1,600 feet of the outlet to Mud Lake. These are depicted in~~ **Appendix A-Attachment B.**

B. ~~Beyond the six seasonal residences / house lots depicted in Attachment B, there are no other residential or commercial enterprises or other established land uses proximal to the site. The Wolfden property is occasionally used for motorized recreation (ATVs and snow mobiles) and these uses foreseeably may continue outside the area of the future operations and any main access roads (although Wolfden reserves the right to assert its property interests against trespassers and assumes no liability for trespass on its property). Roads accessing private parcels within the Wolfden tract are established right of ways to these properties and their use will also continue.~~

14. ANTICIPATED IMPACTS:

~~This Petition contains information on how the proposed Pickett Mountain Mine project meets the criteria for approval to change the current General Management (M-GN) subdistrict to a D-PD Development subdistrict for Metallic Mineral Mining. This includes positive impacts within and adjacent to the LUPCs jurisdiction, positive impacts associated with transportation routes, and potential reclamation and beneficial reuse of the land after mining. These discussions are provided in **Appendix A Sections B(2)(a), (b) and (c).**~~

~~Possible negative impacts of the rezoning are discussed in **Appendix A Sections B(2)(a), (b) and (c),** and **Appendix A Sections B(3)(a), (b), (c) and (d).**~~

~~These discussions are not repeated here to avoid unnecessary duplication in this Petition.~~

15.Figure 7-1 (Exhibit 7 – Attachment A) shows the proposed site plan overlayed onto the estimated boundaries of the orebody. Note that although some wetlands are identified on this map (outside of the proposed boundary) additional wetlands have been mapped within the boundary.

Wolfden Mt. Chase LLC

Exhibit 7: Attachment A - Figures

Exhibit 7 Figures Include:

Figure 7-1 – Estimated Boundaries Ore Deposits

Wolfden Mt. Chase LLC

Exhibit 7: Attachment B - Reports



Exhibit 7 Supporting Documents Include:



Wood Environmental & Infrastructure Solutions, Inc. - Wetland Delineation Survey Pickett Mountain Site,
Maine

Wolfden Mt. Chase LLC



EXHIBIT 8 – SITE PHOTOGRAPHS

8 SITE PHOTOGRAPHS

Site Photographs		
Client:	Wolfden Resources	
Project Number:	3617197478	
Site Name:	Pickett Mountain	
Site Location:	T6 R6, Maine	
Photo Source Wolfden Resources	 <p>Provided Courtesy of LandVest</p>	
Date:		2018
Photograph:		1
Direction (if Known)		Northwest
Description: Looking South toward site over Pleasant Lake.		
Photo Source Wolfden Resources	 <p>Provided Courtesy of LandVest</p>	
Date:		2018
Photograph:		2
Direction (if Known)		North
Description: Looking North from site toward Pleasant Lake		



Site Photographs		
Client:	Wolfden Resources	
Project Number:	3617197478	
Site Name:	Pickett Mountain	
Site Location:	T6 R6, Maine	
Photo Source Wood		
Date:		October 2019
Photograph:		3
Direction (if Known)		Northeast
Description:		Route 11 at junction of gravel access road.
Photo Source Wood		
Date:		October 2019
Photograph:		4
Direction (if Known)		Southwest
Description:		Route 11 at junction of gravel access road.



Site Photographs		
Client:	Wolfden Resources	
Project Number:	3617197478	
Site Name:	Pickett Mountain	
Site Location:	T6 R6, Maine	
Photo Source Wood		
Date:		October 2019
Photograph:		5
Direction (if Known)		Southeast
Description:		Junction with Route 11.
Photo Source Wood		
Date:		October 2019
Photograph:		6
Direction (if Known)		North
Description:		Gravel access road leading into site from Route 11.



Site Photographs		
Client:	Wolfdon Resources	
Project Number:	3617197478	
Site Name:	Pickett Mountain	
Site Location:	T6 R6, Maine	
Photo Source Wood		
Date:		October 2019
Photograph:		7
Direction (if Known)		
Description: View of existing road. Access (typ).		
Photo Source Wood		
Date:		October 2019
Photograph:		8
Direction (if Known)		
Description: View of existing road. Access (typ).		



Site Photographs	
Client:	Wolfdon Resources
Project Number:	3617197478
Site Name:	Pickett Mountain
Site Location:	T6 R6, Maine
Photo Source Wood	
Date: October 2019	
Photograph: 9	
Direction (if Known) Southeast	
Description: View of bridge over outlet stream to Pickett Pond	
Photo Source Wood	
Date: October 2019	
Photograph: 10	
Direction (if Known) Southeast	
Description: View of bridge deck and concrete pier spanning outlet stream to Pickett Pond	



Site Photographs		
Client:	Wolfden Resources	
Project Number:	3617197478	
Site Name:	Pickett Mountain	
Site Location:	T6 R6, Maine	
Photo Source Wood		
Date:		October 2019
Photograph:		11
Direction (if Known)		
Description: View of existing roads (typ).		
Photo Source Wood		
Date:		October 2019
Photograph:		12
Direction (if Known)		
Description: View of existing roads (typ).		



Site Photographs		
Client:	Wolfdan Resources	
Project Number:	3617197478	
Site Name:	Pickett Mountain	
Site Location:	T6 R6, Maine	
Photo Source Wood		
Date:		October 2019
Photograph:		13
Direction (if Known)		Northeast
Description: View of typical uplands within proposed tailings management area.		
Photo Source Wood		
Date:		October 2019
Photograph:		14
Direction (if Known)		North
Description: View of road cut to access to boring site. Upland area in center of proposed tailings management area.		

Site Photographs	
Client:	Wolfdon Resources
Project Number:	3617197478
Site Name:	Pickett Mountain
Site Location:	T6 R6, Maine
Photo Source Wood	
Date: October 2019	
Photograph: 15	
Direction (if Known) Northwest	
Description: Exposed “weathered bedrock” upland area, typical Thorndike soils.	
Photo Source Wood	
Date: October 2019	
Photograph: 16	
Direction (if Known) North	
Description: View of road cut to access to boring site.	

Site Photographs			
Client:	Wolfdan Resources	Project Number:	3617197478
Site Name:	Pickett Mountain Mine	Site Location:	T6 R6, Maine
Photo Source Wood			
Date: October 2019			
Photograph: 17			
Direction (if Known) Northwest			
Description: View of road cut to access to boring site. Note where soils surface and shallow groundwater table has been intersected.			
Photo Source Wood			
Date: October 2019			
Photograph: 18			
Direction (if Known) Southwest			
Description: View of existing roads, northeastern corner of proposed development (tailings pile).			

Site Photographs			
Client:	Wolfden Resources	Project Number:	3617197478
Site Name:	Pickett Mountain	Site Location:	T6 R6, Maine
Photo Source Wood			
Date: October 2019			
Photograph: 21			
Direction (if Known)			
Description: View of typical upland area.			
Photo Source Wood			
Date: October 2019			
Photograph: 22			
Direction (if Known) South			
Description: View of typical wetland area/potential vernal pool south of proposed mine operations area.			

Site Photographs			
Client:	Wolfden Resources	Project Number:	3617197478
Site Name:	Pickett Mountain	Site Location:	T6 R6, Maine
Photo Source Wood			
Date: October 2019			
Photograph: 23			
Direction (if Known) Southeast			
Description: View of old skidder trail with "wet" ruts.			
Photo Source Wood			
Date: October 2019			
Photograph: 24			
Direction (if Known) South			
Description: View of wetlands / potential vernal pool south of the proposed mine operations area.			

Site Photographs			
Client:	Wolfden Resources	Project Number:	3617197478
Site Name:	Pickett Mountain	Site Location:	T6 R6, Maine
Photo Source Wood			
Date: October 2019			
Photograph: 25			
Direction (if Known) Northwest			
Description: View of wetland in southern portion of area.			
Photo Source Wood			
Date: October 2019			
Photograph: 26			
Direction (if Known) South			
Description: View of wetland in southern portion of area.			

Wolfdon Mt. Chase LLC

**EXHIBIT 9 – CONSISTENCY WITH THE COMPREHENSIVE
LAND USE PLAN.**

~~Consistency with the LUPC's Comprehensive Land Use Plan~~

9 CONSISTENCY WITH THE COMPREHENSIVE LAND USE PLAN

The Comprehensive Land Use Plan (CLUP) provides for sound planning practices in the public interest to encourage and manage multiple uses of land and resources within the LUPC's jurisdiction. -The following subsections describe how the proposed rezoning fits within the CLUP, and how the planned Pickett Mountain Mine project would meet the CLUP's goals and policies.

3.19.1 BROAD GOALS

The Pickett Mountain deposit is a unique mineral resource that is ideally situated to allow mineral extraction in an environmentally responsible manner through underground mining while ensuring the following:

- Enhancing the living and working conditions of the people of Maine including property owners and residents by creating an economic benefit in terms of capital investment, training, jobs and enhanced tax base within host and adjacent communities and counties.
- The proposed rezoning will meet the goal of separating incompatible uses. -The area that is proposed for rezoning is currently a general management subdistrict (M-GN) that has been used for timber, and outside the proposed activity the logging operations can continue. -The proposed rezoning will not impact any great ponds.
- The proposed project is designed to have a small ~~foot print~~footprint (approximately ~~528.2646~~ contiguous acres, including 600.1 rezoned acres) with a comprehensive water management plan that will ensure protection of adjacent natural resources including groundwater and surface water quality, forest resources, wildlife and other natural resource values such as plant and animal habitat. -The current information available indicates no known occurrences of endangered, threatened or special concern species within the project area. -The IF&W also has not mapped any significant wildlife habitats within the project area. Based on current information from the MNAP, rare and exemplary botanical features are not present or not expected to be present in the area proposed for rezoning. The MNAP did identify a priority area for a botanical survey on the Wolfden property located between Pleasant and Mud Lakes. -This area is a graminoid/shrub fen and ~~is unlikely to~~would not be affected by the project.- Additional studies of terrestrial flora and fauna and aquatic fauna inside and outside the area to be rezoned will be conducted as part of the baseline monitoring program under the MEDEP Mining Permit Chapter 200 rules and requirements
- The proposed project will allow continued use of forest resources related to logging for wood and fiber production on Wolfden's property.

3.29.2 DEVELOPMENT GOALS AND POLICIES

3.2.19.2.1 Location of Development

The Pickett Mountain Mine project location is dictated by the unique geologic conditions that resulted in the formation of a mineral deposit of economic value. -As such, there are no alternatives to the project

location and the project is exempt from the policy of adjacency. -The location and physical relationship of the mineralized zones to surrounding topography and water bodies allows the deposit to be developed by underground mining methods, which when combined with carefully managed mine water collection and treatment systems will allow mine development, operation and closure without impacting water quality of these adjacent resources. -The manner in which the project will be designed shall be subject to avoidance and mitigation, to the extent possible, of protected natural resources including but not limited to wetlands, vernal pools, rare and endangered species including plants and wildlife. -Therefore, aside from adjacency, the project as proposed, meets the LUPC's development goals and policies with respect to project location.

The project is also unique in having a finite duration currently anticipated to be from 10 - 15 years. Therefore, unavoidable impacts to resources such as wetlands are ephemeral or short lived, and resource values and functions can and will be restored upon project completion. The reclamation of the proposed site will sequentially remove all buildings and structures including the water treatment systems when they are no longer required or needed. -Once the access to underground workings ~~are~~is permanently sealed and the site is regraded and revegetated it will attain the natural character and values that existed prior to mining. -An above ground sub-aerial TMF will remain at closure. -The TMF will be designed with a liner in accordance with ~~DEPM~~DEP Chapter 200 requirements.- This area will contain tailings that have been stabilized and compacted and which could present some risk to the environment, if not managed properly. These risks will however be managed by collection and treatment of water that comes in contact with these materials during operations and capping at closure. -The above ground TMF will be constructed and graded to follow the original upland land surface at an elevation approximately 22 feet higher than the current ridge peak over approximately ~~78.4~~50.5 acres.- This approach will preserve the current appearance of the ridgeline post reclamation.- This area will also be revegetated and designed to allow regrowth of natural ground cover as discussed in later sections of this Petition.

Thus, while meeting many of the goals related to location of development, the project is also consistent with and meets CLUP policies including:

- | | |
|----------|--|
| Policy 1 | Development that is directed to a suitable area and retains the principal values including a working forest, and integrity of natural resources. |
| Policy 2 | The project location is near existing towns (the nearest community being Hersey (4.5 miles) and Patton (9.5 miles) with proximity and connectivity by public roads to other organized town and economic centers, with adequate available public infrastructure and services. |
| Policy 7 | Project allows for (a) planned development dependent on a particular natural feature which is the presence of a metallic mineral resource. |

3.2.29.2.2 Economic Development

One of the CLUP's goals is to encourage economic development that is connected to local economies, is efficient in its use of existing services and infrastructure and is compatible with existing natural resources and surrounding land uses.

The project will provide direct and substantial economic benefit to the local communities and the State (see **Appendix A-Attachment N)- Exhibit 10**). This benefit is in the form of job skills training, primary wages to local employees, wages that are spent in the local economy, an increase in income tax and property tax revenue, and indirect wages at secondary jobs that help support the mining operations (mechanical

equipment repair, vehicle maintenance, road maintenance, solid waste management, and other specialized services).

The site is in vegetative regrowth from past logging efforts that are estimated to have occurred from 75 to 10 years ago.- Wolfden actively leases its timber rights to a local logging company, preserving productive use of its working forests. The proposed development will be largely self-sufficient and not impose an undue burden on local community services or resources (see **Appendix A-Attachment O)-Exhibit 10**). The project will require importation or generation in part of approximately 6 megawatts of electrical supply which is larger than is currently available locally. -This will require construction of approximately 14.6 miles of new transmission line along Route 11 and the existing private gravel access road.

The project occupies a largely upland area removed from adjacent lakes and ponds and would not impact water quality of such water bodies or affect related fish and wildlife resources during the active period of the project. -Plants and natural communities that are located outside of the proposed area of land disturbance would not be impacted. -If rare and exemplary botanical features are identified on-site in subsequent surveys impacts will be avoided to the extent possible, and such plant communities would be relocated or protected pending concurrence with the MNAP. -The planned grading of the TMF will limit ridgeline impacts which will help mitigate scenic impacts. -The presence of cultural resources, including historic logging camps and related structures are not known to be present on the site. ~~-A Phase 0 archeological survey will be conducted in the spring of 2020 to assess the presence of cultural features. The Phase 0 survey will also evaluate the potential for prehistoric archeological resources. A known prehistoric archeological site is in close proximity to the east end of Pickett Pond. Since the extent of the site is limited in size, other mountain areas and other geologic resources would not be impacted.~~A Phase 0 archeological survey was completed and is discussed in Exhibit 24 of this petition.

The site is not in a remote area of the jurisdiction, being located approximately five miles from state highway ~~SR-Route~~ 11 and is accessed by well developed, existing gravel roads on private property.- The planned development of the site will occur along a portion of a ridgeline and at project completion the final profile of the ridgeline would be elevated approximately 22 feet from existing ~~ground surface and parallel to the original profile.~~ the ridgeline surface with an engineered maximum height of 55 feet. This slight alteration should not diminish overall character of the area and regrowth of vegetation common to the area is expected as part of the reclamation.

In addition to these goals the project also meets many elements of the CLUP's policies including the following items:

- | | |
|----------|--|
| Policy 1 | Encourage other resource-based industries and enterprises which further the jurisdiction's tradition of multiple use without diminishing its principal values. |
| Policy 4 | Allow new technologies (sub-aerial tailings) which will provide the LUPC the opportunity to evaluate the technology and its effectiveness. |

3.2.39.2.3 Site Review

A goal of the CLUP is to assure that development fits harmoniously into the existing communities, neighborhoods and the natural environment.

The nature of the proposed project, its location and the proposed reclamation, as discussed in following sections, would ensure a harmonious relationship to the natural environment and local communities.

In addition the project will meet established noise and lighting requirements of the CLUP as specified under section 10.25.F

Noise. The maximum permissible continuous sound pressure level allowable in a D-PD district is determined by the LUPC. Specified maximum sound levels range from 70 dB(A) in daytime (7 am, to 7 pm) to 65dB(A) at night (7 pm to 7 am) for certain subdistricts (commercial-industrial for example) to 55dB(A) and 45dB(A) for all unspecified subdistricts. Construction activities conducted between 7 am and 7 pm are exempt from 10.25F. Other exempt activities include but are not limited to safety and warning signals, traffic on roadways, etc.

During the mine construction phase, noise will be created from construction equipment operating above ground, including drilling and minor blasting. Once the underground development has progressed, blasting will be occurring below ground and will no longer be a source of noise above ground.

During mine operations, the noise source with the largest pressure levels will be the fans used to ventilate the underground workings. Rock crushing is also a source of noise but less so than the ventilation fans. Once crushed, the final milling of the mineralized rock is conducted within a building and is not a large source of noise. The 2 ventilation fans will typically produce 110 decibels (dB) and can be dampened up to 20% to operate at approximately 88 dB. Adding in additional noise sources, a combined noise source estimate is as follows:

$$\sum \text{dB} = 10 \cdot \log_{10} (10^{(L1/10)} + 10^{(L2/10)} + 10^{(Ln/10)})$$

where L1, L2Ln are the separate source sound levels in dB

		L1	L2	L3	L4	L5
		Fan	Fan	Truck	Truck	Loader
Dampening	20%	110	110			
Source dB	L	88	88	88	88	85

$$\sum \text{dB} = \boxed{94.533}$$

		L1	L2	L3	L4	L5
		Fan	Fan	Truck	Truck	Loader
Dampening	0%	110	110			
Source dB	L	110	110	88	88	85

$$\sum \text{dB} = \boxed{113.044}$$

Reduction in pressure levels with increasing distance from a source is described by an inverse square law. The most conservative assumption would be a free field where sound is traveling over an unobstructed plane with no barriers between the source and receptor. Barriers that would exist at the site include buildings and tree lines. Sound is also dampened (absorbed) by the ground and vegetation.

Assuming a free field condition (unobstructed path) reduction in sound would be described as:

$$dL = Lp2 - Lp1$$

$$= 10 \log (R2 / R1)^2$$

$$= 20 \log (R2 / R1)$$

where

dL = difference in sound pressure level (dB)

Lp1 = sound pressure level at location 1 (dB)

Lp2 = sound pressure level at location 2 (dB)

R1 = distance from source to location 1 (ft, m)

R2 = distance from source to location 2 (ft, m)

A "free field" is defined as a flat surface without obstructions.

Assume L1 is 1 foot from the source at measured decibels

The nearest property boundary from the preliminary location of the ventilation fans is approximately 3,000 feet to the south, near Fire Road C. The nearest residence is approximately 8,850 feet to the northeast, on the south side of Pleasant Lake. Applying this equation yields the following reduction with distance from the source.

							Nearest Property Boundar y				Nearest Residence
Source dB (Undamped Fan)	113	113	113	113	113	113	113.04	113	113		113.04
L1 (ft)	1	1	1	1	1	1	1	1	1		1
L2 (ft)	1	10	100	500	1000	2000	3000	4000	5000		8550
dl=	0.0	20.0	40.0	54.0	60.0	66.0	69.5	72.0	74.0		78.6
Receptor dB	113.0	93.0	73.0	59.1	53.0	47.0	43.5	41.0	39.1		34.4
With 20% Dampening	20%										
Combined Source (dB)	94.5										
Receptor dB	94.5	74.5	54.5	40.6	34.5	28.5	25.0	22.5	20.6		15.9

As noise sources can be sometimes unpredictable, confirmatory work for noise in the surrounding area are scheduled to be completed in the summer of 2020. This study will be performed through several avenues and will justify the table above. This study will include a review of similar projects sites related to noise generation and carry as well as a desktop model of noise generation and projection using dampening impacts from trees and hills, etc. The proposed noise prediction model will be developed using the Candna/A software published by

DataKustik GmbH or equivalent software configured to implement ISO 9613-2 environmental noise propagation algorithms.

Calculated Sound Pressure Levels from Source (unobstructed path)

1. ~~Ventilation Fans~~ — With dampening the underground ventilation fans, the expected sound levels at the property boundary and nearest residence are below sound levels for "all unspecified subdistricts". Wolfden intends to use enclosures and other means to dampen the source noise levels. Given the presence of other dampening factors (buildings, vegetation and tree lines), a conservative estimate of noise levels at the property line and the nearest seasonal residence (1.1 miles) indicates that expected noise levels will be very low at approximately 25 dB. It will be considerably lower at 3 miles, perhaps even undiscernible unless there is a wind from that direction. A value of 16 dB.
2. ~~Blasting~~ — Involves the drilling holes into rock then charging or loading the holes with a designed amount of explosives that are numbered with a firing sequence. When detonated, the firing sequence controls which holes "fire" or detonate in order to distribute the energy throughout the rock in a balanced controlled manner. The overall blasting process during the construction and development phase at Pickett Mountain is as follows:
 - ~~Excavation of overburden and loose rocks from the footprint of the portal.~~
 - ~~Drill a blasting pattern (Typically 3 feet x 3 feet square pattern) with 4.5 inch drill holes for desired blast. Typically larger excavations such as portal can take two to three blasts to complete in a very controlled manner.~~
 - ~~Clean all of the holes and measure for accuracy.~~
 - ~~Load explosives and detonators into the holes at design levels and quantities.~~
 - ~~Clear property with sign outs and guards.~~
 - ~~Sound appropriate warnings and alarms~~
 - ~~Detonate the blast.~~
 - ~~Check over the blast to ensure proper detonation and fracturing~~
 - ~~Excavate fractured rock to waste rock storage pad.~~

It is worth noting that open-air blasting to commence the access (portal) for the underground workings is only expected to last two or three weeks. Once underground, (after two to three more weeks) sound from the underground blasting will no longer be heard at the property boundary.

9.2.4 Lighting-

Within the plant operations area, all above ground exterior lights greater than 60 watts or incandescent lights greater than 160 watts will be housed in downward facing full cut-off fixtures as specified in CLUP Standards under 10.25F. -Other sources of light will include vehicle headlights and building interior lighting.

In addition, the project would meet other CLUP policies including the following items:

- Policy 1(a) -A buffer would be established around the proposed area of rezoning and would be far removed from other land use activities.- At closure of the project the ridgeline where the TMF is located would be elevated approximately 22 feet above ~~its current topographic profile.~~ the ridgeline. Once reclaimed and vegetated this will be a minimal change to the natural appearance of the landforms at the site.
- Policy 1(b) _The project will provide for parking at the mine operations site and the transportation routes, described in **Appendix JExhibit 20** would not adversely affect traffic circulation.
- Policy 1(c)_ The only signage visible to the public associated with the project would be for transportation safety at the location where vehicles egress and exit from SR-11 to private roads.
- Policy 2 The project final design will be permitted through the ~~DEPMDEP~~, and efforts will be made to minimize impacts to the principal values of the jurisdiction including avoidance and mitigation of impacts to protected natural resources.

3.2.49.2.5 Infrastructure

The project meets the CLUP's goal of ensuring that infrastructure improvements are well planned and do not have an adverse impact on the jurisdiction's principal values. -These improvements will include upgrading existing gravel access roads located on private lands and the intersection of the private road with ~~State Highway~~Route 11 for public safety purposes.- The project will also, separate from this Petition, establish a new power transmission service line to supply additional needed electrical power for the project.

The power transmission route has been ~~discussed~~planned with Versant Power (Previously Emera Maine) and would run from their substation located on Route 11, located approximately 0.6 miles south of downtown Patten, Maine. -The transmission line would run north and northeast along Route 11 for approximately 9.5 miles then follow the same gravel access road proposed for the mine for approximately 5.1 miles. -The access road upgrades to be considered in the design for the permit application submittal will be developed concurrently with the transmission line design.

The project also meets other CLUP policies including the following items:

- Policy 1 To consider the capacity of existing infrastructure and services to accommodate proposed development. -It is Wolfden's objective that primary workforce be employed locally from residents.- This will require training for that work force since many unique skills are required of miners working underground. -The mine will employ approximately ~~60263~~ workers, composed of ~~30133~~ workers per ~~shift with two shifts per day.~~ on average to support all activities related to the project. With a local workforce, the imposition on existing infrastructure and services (housing, schools, roads, medical facilities, fire, police, solid waste,

and municipal) is minimized since this population is already using these services. –An analysis of the capacity of these services in the local communities is provided in **Appendix A–Attachment OExhibit 10**.

- Policy 2 The project will not require construction or establishment of any new public roads that would degrade the natural character of remote areas.
- Policy 3 The new utility lines, principally electric power transmission, will be located or co-located within or adjacent to existing utility or public road rights of way to the extent practicable. Where new utilities cannot be established along existing utility corridors, they will be designed to minimize visual and physical impacts that would degrade natural values of the area. –The areas contemplated would not be considered remote and would be near or adjacent to existing private roads.
- Policy 5 Although not highly visible, infrastructure at the Site (buildings, water collection and treatment ponds, soil stockpile areas or pens) would be decommissioned, dismantled and removed at the end of the project as part site reclamation. –The land surface once occupied by these buildings would be regraded and returned as close to original grades as possible.

3.2.59.2.6 Development Rate, Density and Type

The project will be constructed in accordance with plans approved by the ~~DEPM~~DEP with input from LUPC. Since the project will be constructed in one phase the density and type of structures will be known and with input from the LUPC, will be consistent with the jurisdiction’s principal values and policies concerning development.

3.2.69.2.7 Affordable Housing

The project does not involve construction of housing, but as described in **Appendix A–Attachment OExhibit 10**, the local employment anticipated by the project will provide employee wages sufficient for those employees to afford available housing in the local market.

3.2.79.2.8 Land Conservation

The project will support the long-term conservation of select areas of working forests in the project area as well as protecting high-value natural resources such as surface water bodies, streams, wetlands, vernal pools, flora and fauna. –The manner in which these natural resources shall be protected is discussed in **Section B (3)(d)–Exhibit 10 and Exhibit 25**. Wolfden will continue to work with local logging companies to manage and allow harvesting of forest resources on its property.

The project would meet the CLUP’s land conservation policy:

- Policy 1 Wolfden has developed cooperative working relationships with local landowners and local timber companies, to ensure continued use of its working forest resources and help maintain public access on private roads to access lakes within its property.

3.39.3 Natural and Cultural Resources and Policies

3.3.19.3.1 Air and Climate Resources

The project will not adversely affect air quality since dust will be controlled and processes that utilize chemicals that would be considered air pollutants are not used. -On-site emission sources will be limited to motorized heavy machinery and vehicles for above ground and underground mining related activities.

Rock crushing operations are a potential source of dust, but adequate provisions will be provided for dust management and control. -Dust suppression is an important operational safety concern below ground in the mine. -Blasted rock is mucked out wet to eliminate dust underground.- Rock placed into the crusher is therefore wet and that moisture greatly reduces dust during crushing operations. -If dust becomes an issue, dust collection equipment can and would be installed above the crusher and removed via a bag house filter. Dust suppression on road and pads on the ground surface would be controlled by the application of sprayed water from a tanker truck, as required.

3.3.29.3.2 Cultural, Architectural and Historical Resources

The Maine Historic Preservation Commission (MHPC) has been consulted and due to the presence of archaeological site 147.001 (MHPC Archeological Survey report 2719- E.C. Jordan 1984) at the headwaters of Pickett Mountain Pond a Phase 0 Archeological survey ~~will be~~was conducted in Spring 2020 as discussed in **Exhibit M-24**. The scope for the Phase 0 survey has been developed in consultation with the MHPC and is presented the **Exhibit M-24**. By working cooperatively with MHPC, the project will meet the CLUP's goal of protecting archaeological and historical resources of cultural significance.

These activities will meet the following CLUP policies:

Policy 1 Identify and protect unique, rare and representative cultural resources to preserve their educational, scientific and social values.

Policy 2. —_Collaborate with other agencies in efforts aimed at the protection of cultural resources.

Policy 3. —_Complete an archaeological survey as part of this development proposal.

3.3.39.3.3 Energy

The project will further the CLUP's energy goals through designs that favor and incorporate energy efficiency and utilization of technologies such as heat pumps to assist heating and cooling at above ground facilities, when possible. -The project will require a new transmission line to provide the needed energy requirements.- The project will of course require emergency back-up power in the form of generators, but these would be used only when needed. -Any new energy generation will be used exclusively for the project. Solar power will also be considered as an alternative source of power and a sufficient area has been allowed for in the rezoned area.

3.3.49.3.4 Forest Resources

As discussed in **Section B (3)(d)Exhibit 2** and **Appendix A-Attachment QExhibit 10** the project footprint will require ~~only 106~~approximately 158.6 acres to be cleared and 122 acres of actual development. -Only the area occupied by the dry stack tailings facility (approximately ~~78.4~~50.5 acres) will be excluded as a future forest resource for lumber and fiber production. -Upon final reclamation, all other areas (approximately ~~7~~108 acres excluding roads) will be returned to current conditions.- The balance of Wolfden's property will be accessible for timber harvest, thus meeting the CLUP's goal to conserve, protect and enhance the forest.

The specific policies items that are supported by the proposed project include:

Policy 1 Encourage active forest management.

Policy 2 Support uses that are compatible with continued timber and wood fiber production, as well as biodiversity.

Policy 3 Protect areas identified as environmentally sensitive.

Policy 5 Support efforts by landowners to manage vehicular access to private roads when necessary to reduce land use conflicts.

Policy 9. —Encourage the use of Maine's best management practices for forestry on its land.

3.3.59.3.5 Geologic Resources

The LUPC has established goals of conserving soil and geologic resources by controlling erosion and protecting areas of significance. —The CLUP's goal with respect to mineral resources is to allow environmentally responsible exploration and mining of metallic and non-metallic mineral resources where there are not overriding, conflicting public values which require protection.

The Pickett Mountain Site is under extensive exploration for mineral resources and there are no identified important natural geological formations, or geologic hazards such as seismically active faults, high elevations or steep slopes subject to instability or erosion. -Based on visual inspection, the area proposed for the project features nearly level to ~~gentle~~moderate slopes with high percentage of vegetative cover and organic matter, and moderate to deeply rooted vegetation in glacially derived soils with a shallow water table. -Fragile soils, most subject to erosion, are not known to be present.

As discussed in **Attachment JExhibit 20**, site access is by existing gravel roads that are currently used for logging operations, and which are in good condition.- Any modification or improvement of these roads will be completed in accordance with a sedimentation and erosion control plan that will be developed during the mine design and permitting phase under ~~DEP~~MEDEP rules.- Based on current information, soil types are suitable for proposed development (i.e., construction of buildings, having ~~apads~~ and ponds, stable foundation for the TMF₁), though more detailed studies, including soil mapping and geotechnical investigations will be required prior to preliminary and ~~subsequently~~ final design of buildings/structures and the TMF.- Soil and groundwater studies will be conducted under the baseline characterization for the MEDEP Chapter 200 permit applications. -These studies will quantify the infiltration capacity of soils and groundwater hydraulic conditions including gradients and saturated hydraulic conductivities and physical properties of site soils. -Such studies will be needed to site, design, and size the ~~PDPs~~infiltration galleries as well as a site septic system.- Such studies will also assist in determining engineering approaches that may be warranted to design improvements to the performance of such recharge/ infiltration systems.—The

~~current proposed PDP locations are away from wetlands where the hydrology conditions would be unfavorable. These larger upland locations for the PDPs are likely situated over thicker unsaturated zones with greater depth to the water table which would be better suited for these purposes.~~

Any modification of roads or the one existing stream crossing (outlet from Pickett Mountain Pond) would be completed in conformance with Land Use Standards enumerated in Chapter 10.27,D.

The proposed metallic mineral mining would occur only within the area rezoned for planned development and would not adversely impact competing uses and public values. -The proposed facility would minimize water, air, land, noise and visual pollution through operations described in **Section B (3)(d) and Appendix A-Attachment QExhibit 2**. These operations will not affect public safety and health, and will avoid undue adverse impacts on fisheries, wildlife, botanical, natural, historic, archaeological, socioeconomic and other values. -The proposed mining operation provides distinct economic and social benefits and would not pose undue burden on existing services as described in **Attachments M, N and OExhibit 10**.

The project will be subject to a long-term post closure monitoring and maintenance program subject to the requirements of ~~DEPM~~DEP Chapter 200 rules and including reclamation of the mine site to restore natural values and protect public health and safety and allow beneficial reuse of the majority of the property.

Specifically, the project would support the following policy items pertaining mineral resources:

- Policy 6 Exploration for mineral resources with minimal disturbance to natural and cultural resources.
- Policy 9. Permit a major metallic mining development in an area zoned for planned development, which broadly considers impacts and benefits, competing uses and public values.
- Policy 10. Regulate the mining operation to minimize water, air, land, noise and visual pollution, to ensure public safety and health, and to avoid undue adverse impacts on fisheries, wildlife, botanical, natural, historic, archaeological, socioeconomic and other values.
- Policy 11. Complete effective monitoring and reclamation of the mining site to protect public health and safety and to promote beneficial reuse where feasible.

3.3.69.3.6 Plant and Animal Habitat Resources

The proposed mining activity is not within areas known to contain unique, threatened or endangered plant or wildlife resources and will be able to meet the CLUP goals and policies to preserve and protect aesthetic, ecological, cultural and economic values of plant and wildlife resources. -The area proposed for development is primarily upland forested habitat, co-dominated by deciduous trees (i.e., beech, birch, and red maple trees) and coniferous trees (i.e., spruce, fir, cedar and hemlock). -The area has been logged in the past decade and is currently in vegetative re-growth.- The proposed mining activities are within an area that is actively logged and would have a lesser short- and long-term effect on habitats than current logging practices. -Since the area is relatively small compared to the surrounding woodland habitat it should not have a negative effect on connectivity of habitats in the area. ~~Wolfden has received preliminary correspondence from the Maine Department of Inland Fisheries and Wildlife concerning potential habitats supporting Rare, Threatened or Endangered (RTE) species. Based on work completed to date habitat supporting rare, threatened, or endangered species are not known to be present in the area. Also, unique habitats such as deer wintering areas, great blue heron nesting sites or habitat for bats, were not observed. Wolfden has conducted delineation of wetlands and vernal pools in spring 2020. Wolfden has conducted~~

delineation of wetlands and vernal pools in spring 2020. Additional studies of terrestrial fauna will be conducted under the baseline characterization work under the ~~MEDEP~~MDEP Chapter 200 regulations and will at that time conduct a final assessment for potential RTE species.

Wolfden has also met with staff of the IF&W as well as MNAP.– There is one area, a fen, between Pleasant and Mud Lakes that MNAP has identified as a priority site for a botanical survey. –This area is far removed from the proposed site and would not be adversely affected by proposed activities and is outside the area proposed to be re-zoned. –The MNAP environmental review for the project is presented in **Exhibit N-25**. Based on current information RTE plants are unlikely to be present in the upland areas proposed for rezoning.– Wolfden plans on conducting additional evaluations of terrestrial flora in consultation with the MNAP under the ~~MEDEP~~MDEP Chapter 200 baseline characterization program and if plant resources requiring protection are identified, Wolfden will make appropriate accommodations to avoid impacts where possible. Detailed analysis and reports related to plant and animal habitat resources are included in **Exhibit 25**. Within Exhibit 25, Wolfden outlines specific measures it would take to coordinate and work with supporting resources agencies to enhance and/or protect habitat for Canada Lynx, Northern Long-eared Bats, Atlantic Salmon, Brook Trout and Landlocked Salmon within the land that it owns.

Specifically, the policy items that would be met by the project include:

- Policy 1.– Coordinating with and supporting agencies in the identification and protection of a variety of high-value wildlife habitats, including but not limited to: habitat for rare, threatened or endangered species; rare or exemplary natural community and ecosystem types; native salmonid fish species; riparian areas; deer wintering areas; seabird nesting islands; waterfowl and wading bird habitats; and significant vernal pools.
- Policy 2. – Conduct land use activities that are protective of sensitive habitats, including but not limited to habitats for fish spawning, nursery, feeding and other life requirements for fish species.
- Policy 3. – Develop the site in a manner that retains connectivity of habitats and minimize road mortality of wildlife by promoting road building practices that facilitate wildlife movement and by directing development to appropriate areas.
- Policy 5. – Protect wildlife habitat in a fashion that is balanced and reasonably considers the management needs and economic constraints of project owner (landowner).
- Policy 7. – Encouraging sustainable land use (forestry management) over much of the Wolfden parcel which will contribute to maintaining a large tract of undeveloped land, with ecological significance that is important locally to healthy plant and animal populations.

3.3.79.3.7 Recreational Resources

See ~~Section 19~~**Exhibit 15** of this Petition for additional discussion of recreational resources.

The specific recreational resource policies of the CLUP that would be met or supported by the proposed project include:

- Policy 6.– Cooperative efforts that assure continued public access across any rights of way on Wolfden's property (excepting reasonable restrictions on certain roads that lead to the mine site, if needed for public safety). There is no intention of impact to recreational trail connections or traditional recreational activities near the project site. Wolfden commits to

modifying or relocating trail connections if circumstances related to the safety of workforce or general public are identified.

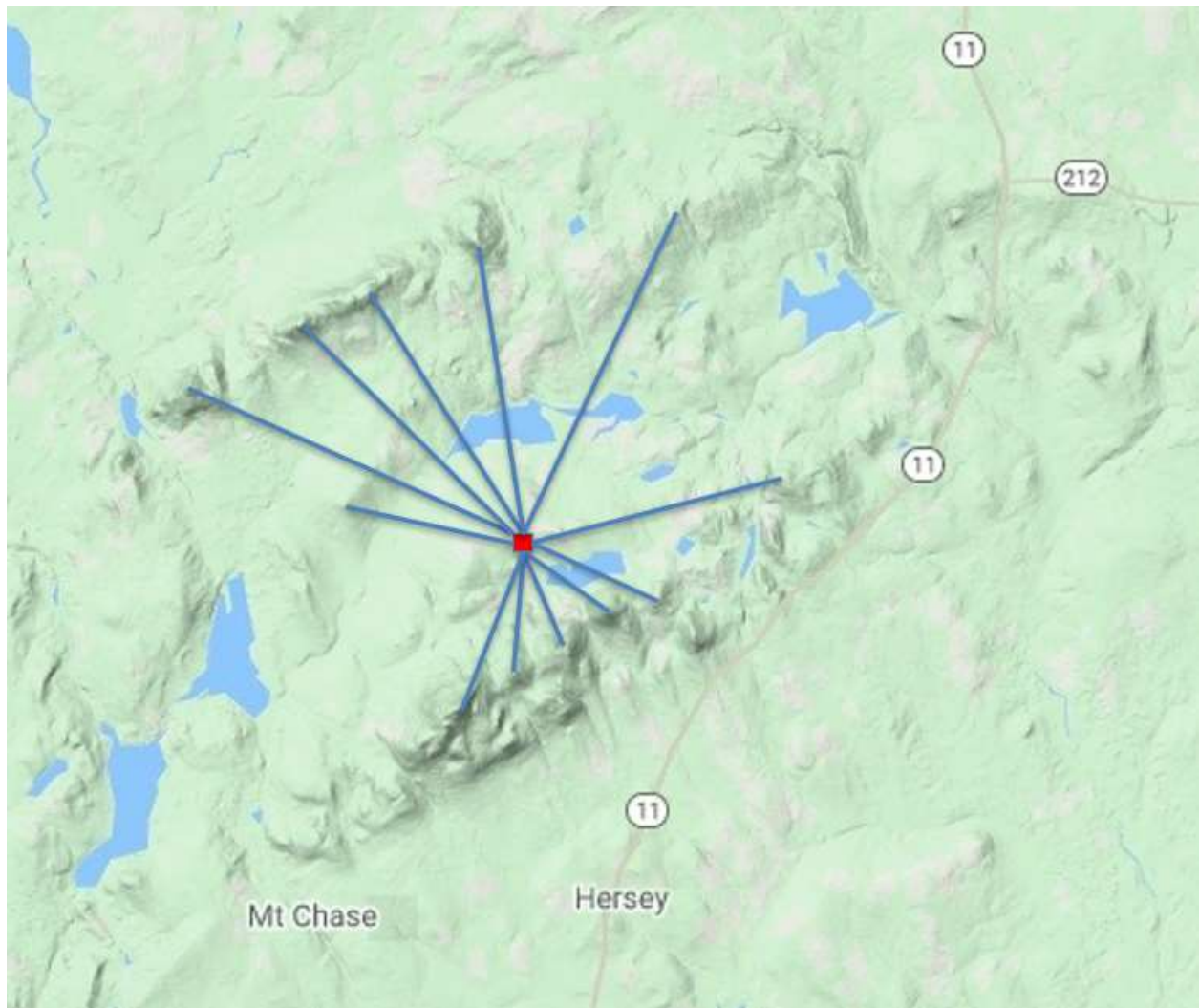
Policy 7. — Efforts on the part of Wolfden that ensure continued public access to public ~~waters~~water .

Policy 8. — Responsible use of Wolfden's property.

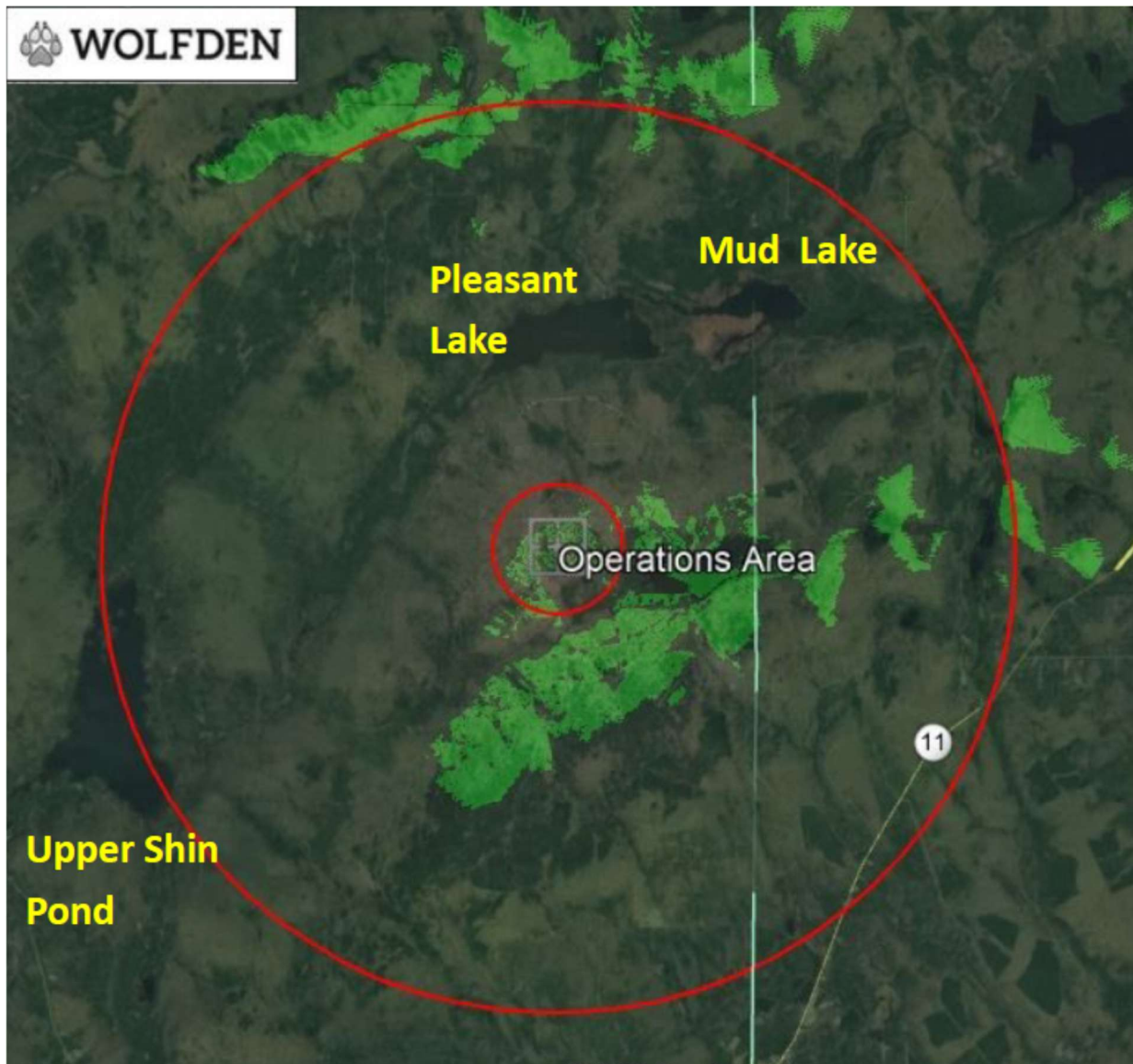
3.3.8 Scenic Resources

~~The topography surrounding the site provides the area proposed for rezoning a high degree of visual screening from public roads (Route 11 and Route 159) and the established high use recreation areas located to the west of the site. The area proposed for rezoning has a prominent ridgetop immediately west of the areas where proposed buildings would be constructed screening those buildings from view from that direction. A ring of higher elevation peaks is present south of Picket Mountain Pond and north and west of Pleasant Lake. While an unobstructed line of sight exists from Pickett Mountain Pond, Pleasant Lake, Mud Lake and Grass Pond, the visibility of the site would likely be obscured by tree lines that would be left in place around the developed areas. The most visible portion of the site would be the northern and northeastern corners of the dry stacked tailings area.~~

~~The landforms surrounding the site are complex rolling hills and moderate elevation mountain peaks with mixed forests, that would be more tolerant to visual impacts from the site. Based on the topography, landforms and forested nature of the area, the proposed site is a reasonably harmonious fit with the surrounding environment and generally meets the CLUP's goal of protecting the high value scenic resources of the surrounding area.~~



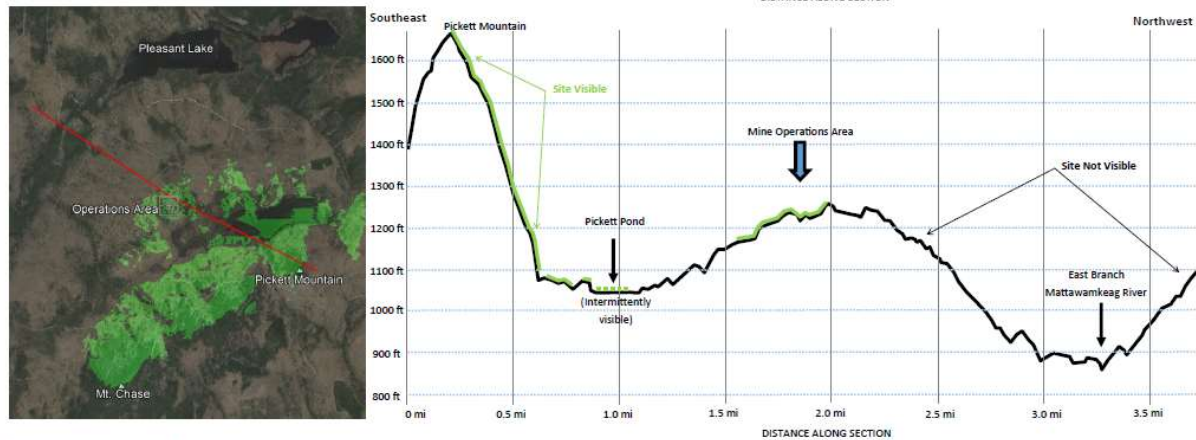
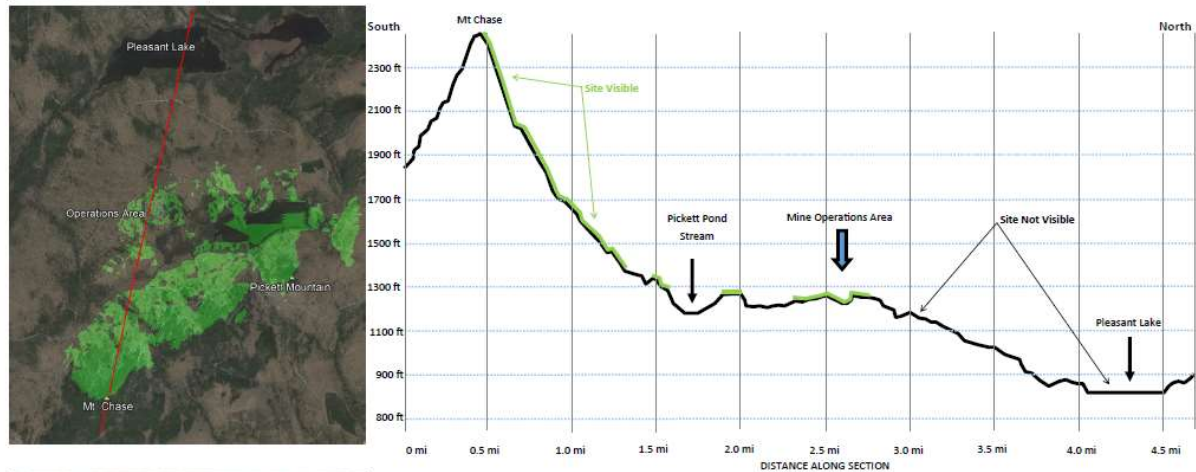
Peaks Surrounding Pickett Mountain Project Site



Three Mile Radius Analysis

The inner circle of the image above represents a 0.5 mile radius which encompasses the proposed site boundary. The outer circle is a 3.5 mile radius to show a net 3 mile radius from the boundary of the property. The analysis was conducted using a Google Earth Viewshed model (ground surface digital elevation model), which uses ground surface elevations to construct line of sight analysis. The view height is 10 meters above ground level to simulate a building 10 meters above average tree height. The highlighted areas (and those highlighted on surrounding peaks) are potential areas with a line of site to the property. The 10 meters or 33 feet above the tree line was selected assuming the trees in the area are ~27 feet tall for a total building height of 60 feet. It should be noted, that to obtain a line of site to the property from the surrounding areas, one has to be above the tree line to have an unobstructed view. The property will not be visible from anywhere along Route 11 nor from any State park or State managed trail.

There are no official trails within the proposed area, however, within a 3.0 mile radius of the site boundary, there are several ATV, snowmobile and hiking trails as shown in attachment L. Hiking trails are along the south face of the mountain belt and a snowmobile/ATV trail travels along the north face of the mountain belt. Based on the sections below, trails that are travelled along the north face of Mount Chase are likely to have visual line of site to the property if standing on a cleared area. The tallest building on the property is estimated at 60 feet tall and would rise above the tree line approximately 10 meters and therefore would be the most visible point. Additional site specific studies (such as the LUPC weather balloon test protocol for communications towers) could be conducted to obtain a better understanding of actual visibility.



Viewshed of Operations Area (Green)

Topographic Profiles Across Site

Viewshed Sections

3.3.99.3.8 Water Resources

Appendix A Section B(3)(d) **Exhibit 10** provides a discussion of Potential Impacts to Existing Uses and Natural Resources and provides an overview of mine water management, involving the collection and treatment of precipitation that contacts mined rock materials and tailings. -The project description in **Section 4Exhibit 2** of this Petition describes the operations and reclamation phases of the project.- Collectively these environmentally responsible mine-management practices would prevent degradation or impacts to groundwater and surface water and protect water quality in adjacent aquatic habitats including wetlands, vernal pools, streams, lakes and ponds. -These actions would meet the CLUP's goal of protecting the quality and quantity of surface waters and groundwater.

The project will have no direct impact on shorelands since the project location is removed from such features.

The specific CLUP policies that will be advanced through the planned development and regulatory framework include the following:

- Policy 1 Regulate uses of land and water in order to prevent degradation of the jurisdiction's excellent water quality and undue harm to aquatic habitat.
- Policy 2 Protect the recreational and aesthetic values associated with water resources.
- Policy 4 Conserve and protect lakes, ponds, rivers, streams and their shorelands, which provide significant public recreational opportunities.
- Policy 8 Control land uses on identified aquifers and their recharge areas in order to prevent adverse effects on water quality or quantity
- Policy 10 Protect ground water quality throughout the jurisdiction through proper controls on potentially polluting activities.
- Policy 12 -Conserve the quality and quantity of public and certain private water supplies by managing land use in source protection areas.

3.3.109.3.9 Wetland Resources

See **Exhibit 10** of this Petition for a discussion of wetland resources.

The specific wetlands resource policies of the CLUP that would be met or supported by the proposed project include:

Policy1 Support the nationwide goal of no net loss of wetland functions and values by avoidance or minimization of impacts.

Policy 2 Provide compensation to offset loss or degradation of wetland functions, while recognizing that such losses may not be avoidable in every instance.

Policy 3 Plan development to avoid alteration of wetland areas. See Appendix A Section B(3)(d) of this Petition for a discussion of wetland resources.

The specific wetlands resource policies of the CLUP that would be met or supported by the proposed project include:

~~Policy 1 — Support the nationwide goal of no net loss of wetland functions and values by avoidance or minimization of impacts.~~

~~Policy 2 — Provide compensation to offset loss or degradation of wetland functions, while recognizing that such losses may not be avoidable in every instance.~~

~~Policy 3 — Plan development to avoid alteration of wetland areas. If avoidance is not feasible, ensure that development minimizes alteration. If loss of wetland functions is unavoidable, require actions to restore, reduce or gradually eliminate lost or degraded wetland functions. If necessary, require compensation for lost or degraded wetland functions through protection of wetlands of equal or greater value.~~

~~If loss of wetland functions is unavoidable, require actions to restore, reduce or gradually eliminate lost or degraded wetland functions. If necessary, require compensation for lost or degraded wetland functions through protection of wetlands of equal or greater value.~~

~~16. SHORELAND DEVELOPMENT.~~

Wolfdon Mt. Chase LLC

**EXHIBIT 10 – SURROUNDING USES AND ANTICIPATED
IMPACTS**

10 SURROUNDING USES AND ANTICIPATED IMPACTS

10.1 Introduction

The proposed following subsections present an assessment of potential for impacts to natural resources

A significant component of this discussion is dedicated to surface waters (ponds and streams) and groundwater since these are the resources most vulnerable during the development, operation and closure of the Pickett Mountain mineral deposit. This evaluation discusses the nature of the water resources including the relationships between topography, location of groundwater divides, areas of groundwater recharge and groundwater discharge. An initial estimate of an overall hydrologic water balance for the site is also provided. is not adjacent to the shoreland of

The mine development, operation and closure strategy are predicated on protecting this water related resources. Therefore, a discussion of this overarching strategy is presented after discussion of the resources and addresses how these resources will be protected.

This information is followed by a general discussion of the mine development, operation and closure strategy and the management of mine-related waters. Those approaches, as well as the physical setting of the mineral deposit provide the means for mitigation of potential impacts to water resources.

10.2 Surrounding Uses

Within one mile of the site, the area is forested and is currently in use for wood harvesting. In general, the area beyond one mile is surrounded by commercial forests. lake. Lakes-The site has been logged within the last 5 to 10 years and is in vegetative regrowth. Pickett Mountain Pond is within one mile of the site and Pleasant Lake (and nearby Mud Lake) are slightly beyond a mile. Maine Department of Inland Fisheries and Wildlife (MDIFW) surveys (1958 and 1953 respectively) indicate both are shallow mud bottom ponds with warm temperatures at all depths in summer months. The ponds did not have conditions supportive of cold-water fish species at the time of these surveys, but inlet and outlet streams (West Branch of the Mattawamkeag River, Pickett Mountain Stream and Spring Brook) provided spawning and nursing areas for trout and landlocked salmon. Pleasant Lake, Mud Lake, and Grass Pond are all designated as Heritage Fish Waters by MDIFW. Maine Heritage Fish Waters are native and wild brook trout lakes and ponds which represent unique ecological and valuable angling resources. MDIFW surveys of Pleasant Lake identified the presence of cold-water springs in Pleasant Lake that support the landlocked salmon and trout fishery and a during a more recent survey conducted in 2019, found ideal dissolved oxygen levels from top to bottom and excellent brook trout growth.

The use of these ponds and streams for recreational use is not restricted. There are six seasonal residences around Pleasant Lake; two that are located within 675 feet of the southern shore, and four that are located along the northern shore within 1,600 feet of the outlet to Mud Lake. These are depicted in **Exhibit 3**.

Beyond the six seasonal residences depicted in **Exhibit 3**, there are no other residential or commercial enterprises or other established land uses proximal to the site. The Wolfden property is occasionally used for motorized recreation (ATVs and snow mobiles), and these uses foreseeably may continue outside the area of the future operations and any main access roads (although Wolfden reserves the right to assert its property interests against trespassers and assumes no liability for trespass on its property). Roads accessing private parcels within the Wolfden tract are established right of ways to these properties and their use will also continue.

This Petition contains information on how the proposed Pickett Mountain Mine project meets the criteria for approval to change the current General Management (M-GN) subdistrict to a D-PD Development

subdistrict for Metallic Mineral Mining. This includes positive impacts within and adjacent to the LUPCs jurisdiction, positive impacts associated with transportation routes, and potential reclamation and beneficial reuse of the land after mining. Both positive and negative potential impacts are discussed further in this Exhibit.

10.3 Anticipated Impacts

10.3.1 Wildlife Habitat

There is no anticipated impact on Wildlife Habitat which is discussed in detail in **Exhibit 25**.

10.3.2 Recreational Resources

Impact to recreational resources will be negligible with the only impact related to two potential viewpoints. One from an ATV trail running along the north side of Mount Chase and another from a hiking trail to the summit of Mount Chase. Recreational resources are discussed at length in **Exhibit 15**.

10.3.3 Water Supplies and Mapped Aquifer Description

The proposed facility is not located near a high yield sand and gravel aquifer nor a high yield bedrock aquifer. **Figure 10-2 (Exhibit 10 - Attachment A)** shows the mapped sand and gravel aquifers in the area. All contact waters will be collected and treated prior to discharge ensuring that recharging waters will not impact overburden and bedrock groundwater resources as discussed later in this Exhibit. During mine development and mine bedrock groundwater movement is toward the mine workings since they will exist in a dewatered state. Sulfides present in bedrock below the water table are in a reducing state and will not be oxidized. This aspect of hydrologic control further protects bedrock groundwater resources. Existing groundwater quality in bedrock will be characterized as part of the background study for MDEP permitting and will be the basis to evaluate and remediate any impacts should they occur.

10.3.4 Project Area

The area surrounding the Pickett Mountain Project site is wooded and the primary use is forest industry related. Six seasonal residences are present on the southern and northern shore of Pleasant Lake which are used for recreation there along with other great ponds. The area is also used for motorized recreation, including ATVs and snowmobiles. **Figure 10-1 (Exhibit 10 - Attachment A)** provides a 3-mile radius around the site indicating the location of these features which are further described below.

A medium yield sand and gravel aquifer has been mapped along the north shore of Pleasant Lake. Indicated yields are ≥ 10 gallons per minute. The yield of the residential well on the south side of Pleasant Lake is reported as ≥ 8 gallons per minute. ~~include Pickett Mountain Pond and within a 3-~~It is presumed that all seasonal residential lots have private water supplies, though this has not been confirmed by a well survey. There are no other known private or public water supplies within a three-mile radius ~~include Pleasant Lake and Mud Lake and several smaller ponds including of the site.~~ **Figure 10-2 (Exhibit 10 - Attachment A)** depicts these features in addition to inferred surface water divides and groundwater flow direction in the vicinity of the site.

10.3.5 Lakes and Ponds

A three-mile radius from the perimeter of the area proposed for rezoning extends to the eastern shoreline of Upper Shin Pond and encompasses Pleasant Lake, Mud Lake, Huntley Duck Pond, Pickett Mountain Pond, Grass Pond, Bear Mountain Pond. Tote Pond located between Grass Pond and Bear Mountain Pond drains

eastward to Hale Pond, which then drains south. Green Pond, located to the north of Hale Pond, drains north to the West Branch of the Mattawamkeag River entering south of Duck Pond. , Tote Road Pond, Grass Pond, Duck Pond and Huntley Pond.

Based on the USGS Green Mountain Quadrangle 7.5-minute series topographic map (1986 Provisional Edition) Hale Pond, Bear Mountain Pond, the un-named pond, Grass Pond and Pleasant Lake are accessible by private un-improved roads (gravel logging roads). These ponds are typically located within 500 feet of an unimproved road. Mud Lake, Huntley Pond, Duck Pond, Green Pond and Pickett Mountain Pond are typically located within 500 to 1,000 feet of a trail. The site would be visible from Pickett Mountain Pond and the eastern side of the unnamed pond. It would not be visible from the other ponds.

The current level of use of these ponds is low given their shallow nature and limited public access. After investigation through discussion with local residences, the level of use of lakes and ponds within the 3-mile radius of the proposed boundary has been confirmed. Pickett Pond is very shallow with an average depth of approximately 2 to 3 feet and has no boat launch access. Pleasant Lake has a higher level of use due the presence of six seasonal residences near or along its southern and northern shoreline as well as an unimproved boat launch along the southern shoreline. It has an average depth between 6 to 10 feet and accommodates for 2-3 boats on the water daily in peak season. Downstream, Rockabema Lake receives 4-5 boats on the water for up to 5 hours daily and is known to be a more active lake with respect to recreational fishing. Direct visual impacts will be realized from Pickett Pond however minimally. Nearby Pleasant and Rockabema lakes will have no visual impact from the project. Access to each lake will be unrestricted by the project and related activities. It is anticipated that some increase in the level of use of Pleasant Lake for recreational fishing will occur from the increase in employment traffic during operation of the project and the resulting increase in awareness of the potential to access to water bodies surrounding the project.

The eastern shore of Upper Shin pond is within the three-mile radius as depicted in **Figure 10-1**. The site is not visible to either Upper or lower Shin Pond or Shin Pond Village. The eastern shore of Upper Shin Pond contains approximately 20 private residences. Upper and Lower Shin Pond and surrounding area used actively year-round for recreation by fishing, hunting; hiking, ATV, snowmobile enthusiasts. Shin Pond Village and Mount Chase Lodge have year-round lodging and the former seasonal tent and RV campsites. Hunting on the parcel proposed for rezoning has not been observed by Wolfden.

10.3.6 Campsites

The closest identified campsites are in Shin Pond Village, approximately five miles from the Site. No impacts from the project are anticipated at these sites.

10.3.7 Trails

The area around the site with three miles contains a network of un-improved gravel roads, used primarily for logging, in addition to access to seasonal residences along Pleasant Lake. In addition, there are isolated and interconnected trails that connect to these gravel roads used by recreational vehicles. The only published hiking trail is located approximately 5 miles away to the summit of the Mount Chase approaching from the South. The site will potentially be visible from this summit. No restrictions to these trails will be imposed by the project site or its related activities.

Combined use ATV/snowmobile trails have been developed in the areas surrounding the site including portions of the ITS snowmobile trail system and groomed trails maintained by local clubs. The closest ATV/snowmobile trail follows gravel road south of the Site (sometimes referred to as Fire Road C), and traverses north of Mount Chase to south of Pickett Mountain. The site would be visible from a single outlook

from this trail (also identified as local snowmobile trail 62). The site would not be visible from any other ATV/snowmobile trails located to the east, west and north. In summary, the site would be visible only to reactional trails located immediately south at distances from 0.9 to 1.2 miles. Visible infrastructure would be the top of the concentrator building where is stood above the tree line, the headframe and the tailings facility. The concentrator can be designed to blend in with the surrounding environment to reduce visibility from points such as this. The estimated level of use for the ATV trails is 500 trail riders per month and 700 trail riders per month for snowmobiles. Consultation with the nearby Katahdin Lodge, Shin Pond Village, and Patten ATV club was completed to provide guidance on usage and locations of trails.

10.3.8 Public Boat Launches

There is a single public boat launch located on the south border of Pleasant Lake and a public boat launch on the northeastern shore of Lower Shin Pond, which is not located within 3 miles of the site. The site is not visible from either Lower or Upper Shin Pond. The boat launch located on Pleasant Lake is an unmaintained, and limited access located on the southeast boundary. The level of use of this boat launch is estimated at up to 10 uses per month with a maximum of 2-3 uses per day as a peak, based on anecdotal evidence by the nearest camp tenant to the launch. Some additional impact to the use of the boat launch is anticipated due to increased traffic to the area by employees of the project during operation. Wolfden intends to repair and maintain a more suitable public boat launch for expected use by the site employees as well as others who recreate on the lake.

10.4 General Measures Undertaken to Assure Mining Will Not Have Undue Adverse Impacts on Existing Uses and Resources Including Measures to Avoid, Minimize or Mitigate Any Adverse Impacts

10.4.1 Introduction

The following subsections present an assessment of potential for impacts to natural resources including forest resources; historic sites; wildlife and plant habitats; scenic resources; water resources; and recreation resources.

A significant component of this discussion is dedicated to surface waters (ponds and streams) and groundwater since these are the resources most vulnerable during the development, operation and closure of the Pickett Mountain mineral deposit. This evaluation discusses the nature of the water resources including the relationships between topography, location of groundwater divides, areas of groundwater recharge and groundwater discharge. An initial estimate of an overall hydrologic water balance for the site is also provided.

The mine development, operation and closure strategy is predicated on protecting these water related resources. Therefore, a discussion of this overarching strategy is presented after discussion of the resources and addresses how these resources will be protected.

This information is followed by a general discussion of the Pickett Mountain mine development, operation and closure strategy and the management of mine-related waters. These approaches, as well as the physical setting of the mineral deposit provide the means for mitigation of potential impacts to water resources.

The following sections describe the physical setting, surface water, groundwater hydrogeology and groundwater resources.

10.4.2 , Pleasant Lake, Mud LakePhysical Setting and Surface Water Resources

The Pickett Mountain Deposit is situated beneath a portion of an approximate 2.7-mile-long ridge with moderate elevations ranging from 1,360 to 1,140 feet (west to east). The ridge is bordered to the south by Pickett Mountain Pond, to the east by Tote Road Pond and Grass Pond, and to the north by Pleasant Lake and Mud Lake. Pickett Mountain Pond flows through an unnamed stream to Grass Pond and hence north to Mud Lake and the West Branch of the Mattawamkeag River. Pleasant Pond flows easterly to Mud Lake. Tote Road Pond outlets to a stream that flows easterly to Hale Pond and hence northerly through Green Pond to an unnamed stream that also joins the West Branch of the Mattawamkeag River.

The various lakes and ponds have the approximate following acreages:

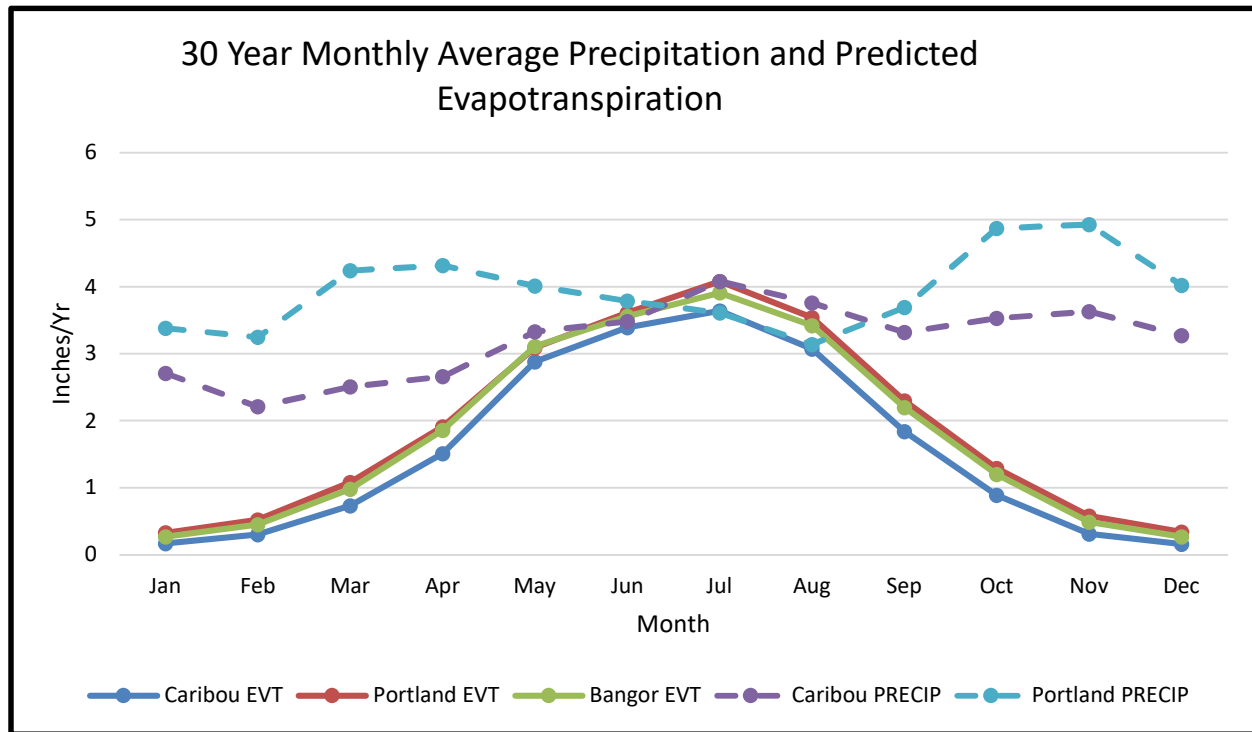
- Pickett Pond 173 acres
- Grass Pond 42 acres
- Pleasant Lake 310 acres
- Mud Lake 188 acres
- Tote Road Pond 28 acres

The ridge occupying the Pickett Mountain Deposit is bordered to the south (approximately 1.5 miles at its closest) by higher elevations including Mount Chase, Long Mountain and Pickett Mountain and to the north by Hay Brook Mountain, Roberts Mountain and Green Mountain. Another intervening ridge of similar elevation is present north of the West Branch of the Mattawamkeag River (approximately 3.5 miles at its closest), where it enters the west side of Pleasant Lake. Surface water drainage and shallow groundwater discharge from the southern slope of this intervening ridge and Green Mountain contribute groundwater and surface water flows along the north side of both Pleasant and Mud Lakes. Prior field observations including surface water temperature measurements indicate the presence of groundwater seeps that flow into Pickett Mountain Pond and the stream flowing from it. Long Mountain and Pickett Mountain to the south, also contribute to groundwater and surface water inflows to Pickett Mountain Pond.

10.4.3 Groundwater Hydrogeology

Based on subsurface drilling conducted during mineral exploration activities, the site is characterized by relatively thin glacial deposits which mantle bedrock with moderate to steep slopes. Except for the occasional rock outcrop or rock ridge, the entire area is forested. Within margins of intervening valleys stratified glacial deposits are potentially present. Groundwater and surface water divides are expected to be controlled by topography and groundwater flow direction should mimic topography. **Figure 10-2 (Exhibit 10 – Attachment A)** provides a depiction of the anticipated groundwater and surface water divides and indicates anticipated groundwater flow directions. Based on studies of similar geologic and geographic settings (Gerber and Hebson, 1996) and historically averaged precipitation data (<http://www.nrcc.cornell.edu/wxstation/pet/pet.html>), the site is anticipated to receive approximately 45 inches of total annual precipitation (**Figure 10-3**). Recharge to groundwater (Net precipitation minus evapotranspiration) will result in overburden groundwater and shallow bedrock groundwater recharge and groundwater flow toward surface water bodies including lakes, ponds and streams.

Figure 10-3: Average Precipitation and Evapotranspiration Rates Across Maine



The majority of shallow groundwater recharge is in spring and fall when temperatures are above freezing and evapotranspiration rates are lowest, and precipitation highest as depicted in **Figure 10-3**. The majority of recharge will be too shallow (possibly perched) and deeper overburden groundwater, where present, with a smaller amount of recharge to bedrock groundwater, typically in the range of 2-10% (Gerber and Hebson, 1996). This deeper groundwater, including overburden and bedrock, will form the base flow of groundwater discharge to surface water bodies such as Pickett Pond and Pleasant Lake.

The perched shallow groundwater that occurs in the shallow developed soil horizon is critical to the infiltration of precipitation and movement of shallow groundwater that supports wetlands and baseflow of intermittent and perennial streams. This component of subsurface flow is distinct from the deeper saturated groundwater conditions, where present, in the denser, silty glacial tills. Investigation of the soil suitability at the Site conducted by Atlantic Resource Co. LLC (ARC, 2020) provided soil classifications of this shallow soil located above restrictive layers that included bedrock, the water table or till. The mean depth to these restrictive layers is approximately 15 inches where observed. The depth to shallow bedrock where observed ranged from 4 to 40 inches and averaged 19 inches. Based on published soil vertical soil hydraulic conductivity values for these soil types, the mean expected horizontal saturated hydraulic conductivity is estimated to be in the range of 19.8 feet/day for these shallow soils. The ratio of horizontal to vertical hydraulic conductivity is typically assumed to be 10:1.

In comparison the hydraulic conductivity of silty glacial tills is typically low (< 1 feet/day). For Bald Mountain, the USGS (Fontaine, 1989) estimated in-situ hydraulic conductivity values in the range of 0.03 to 0.2 feet/day. Therefore, the movement of deeper saturated overburden groundwater, where present, at the site is expected to be slow (< 0.2 feet/day) given anticipated hydraulic gradients, which should approximate the slope of the hill slope from the site to Pickett Mountain Pond (0.05 feet/feet). Where saturated overburden is not present and soils are thin, infiltration will recharge bedrock directly. The slow groundwater migration

rates and large distances to surface water bodies from the site (3,500 feet to Pickett Pond and 6,500 feet to Pleasant Lake offer a high degree of protection to surface and ground water resources.

10.4.4 Significant Sand and Gravel Deposits

A surficial deposit with good to moderate potential yields is mapped along the northern side of portions of Pleasant and Mud Lakes (**Figure 10-2**). Based on topography and subsurface drainage basin boundaries indicated on the Significant Sand and Gravel Aquifers Map of the Green Mountain Quadrangle (MGS Open File No. 01-75 2001) surface water divides are generally coincident with groundwater divides. This significant sand and gravel deposit therefore does not receive recharge or run-off from site (i.e., the north facing portion of the ridge that contains the Pickett Mountain Deposit) and would not be affected by the proposed project.

10.4.5 Hydrologic Water Budget - Overburden and Bedrock Groundwater Resources

A divide in surface water and groundwater occurs along the ridge separating surface water and groundwater flow to Pickett Mountain Pond and Pleasant Lake (**Figure 10-2**). The drainage sub-basin occupied by this portion of the ridge occupies approximately 3,330 acres (830 acres south of the divide and 2500 acres north of the divide). On average it is expected that 42% of precipitation is lost to evapotranspiration and surface run-off, with the remaining water budget resulting in recharge to overburden and bedrock groundwater (Gerber and Hebson, 1996). Approximately 5% of precipitation is assumed infiltrate to bedrock. This results in the following estimated water balance for the sub-basin provided in the following table. Most of the overburden groundwater would be expected to discharge locally within the local drainage basin (>95%), with the exclusion of recharge to bedrock. Some shallow bedrock groundwater would also be expected to discharge locally to streams in upland mountain areas and deeper sections of ponds, where present.

Estimated Hydrologic Budget

Area	Size (acres)	Net Precipitation (acre/feet/yr)	Evapotranspiration (acre/feet/yr)	Net Precipitation gallons/year	Evapotranspiration gallons/year	Groundwater Recharge gallons/year	Overburden Recharge gallons/year	Bedrock Recharge gallons/year
Total Sub-Basin	3330	11933	5012	3,887,952,156	1,632,939,905.52	2,255,012,250.48	2,142,261,638	112,750,613
North of Divide	2500	8958	3763	2,918,883,000	1,225,930,860.00	1,692,952,140.00	1,608,519,547	84,658,924
South of Divide	830	2974	1249	969,069,156	407,009,045.52	562,060,110.48	534,028,490	28,106,763
Developed Mine Area	54.0	194	0	63,059,548				
Percent Excluded from Sub Basin During Mine Operation	1.6%			1.6%				
Total Annual Precipitation 45 Interception 2 (direct runoff) 4% Net Annual Precipitation 43 inches (available for recharge) 3.58 feet Bedrock Net Recharge 5 % 5% EVT Rate & Run-off 0.42 % 42% Developed Mine Area = area where precipitation/ runoff is collected for treatment and re-infiltrated. Assumes 25.23 Acres of the Total Tailings Area (1/2) open at at given time 25.23 Acres of tailings open at any time 2.79 Acres North tailings Lined Collection Pond 1.45 Acres South Tailings Lined Collection Pond 3.55 Acres PreTreatment Storage Pond 1.95 Acres of Post Treatment Storage Pond (does not require treatment) 3.77 Acres Waste Rock Storage Facility 1.33 Acres Mill Feed Storage Pad 5.52 Low Grade Ore Pad 1.19 Buildings 7.23 Roads 54.0 Acres Total Area Where Precipitation is Collected								

The total area of land disturbance for mine development (excluding roads) is approximately 122 acres and includes the footprint of buildings, mine portal, a surface water management facility and a dry TMF (approximately 50 acres). The total area cleared is expected to be approximately 158.6 acres. Precipitation over much of this area will be managed to control run-off of non-contact waters, and water that potentially contacts waste materials including waste rock and exposed tailings in the TMF (approximately 50 % or 25

acres at any given time). The TMF would be closed sequentially as cells are developed and filled to reduce the area of tailings coming in contact with water and requiring treatment. Collected waters will be treated as discussed later in this exhibit.

The area of mine development during operations is intentionally limited in size. When the water budget within this area is compared to the drainage basin, it becomes clear that impacts to recharge of groundwater (overburden and bedrock) and run-off of surface water to surface water bodies is negligible basin wide, and as a percentage (1.2%) is within the range of annual variations in precipitation. Even if average annual precipitation varied by as much as 10% (+/- 5 inches), the percent reduction in recharge remains essentially the same. The immediate reduction in recharge is replaced by re-infiltration of clean treated effluent from the water management system (which is reflected in the table above).

The immediate potential impact that, if not properly managed, could result would be a reduction of recharge to the shallow /perched groundwater system that supports the development of wetlands and associated intermittent and perennial streams within the site. Therefore, considerable attention has been paid to areas where water is being collected for treatment up gradient of mapped wetlands so that re-infiltration of clean treated water in these areas can be managed to prevent impacts to the wetland hydrology.

10.4.6 Wetland Resources

The U.S. Fish and Wildlife Service has mapped wetlands in T6R6 as a part of the National Wetland Inventory (NWI). The NWI mapped wetlands have been promulgated into LUPC Land Use Guidance Maps. There are NWI mapped wetlands on the property. The mapped wetlands are primarily palustrine forested and palustrine scrub/shrub wetlands, associated with Pleasant Lake and Pickett Mountain Pond. In addition, the West Branch of the Mattawamkeag River flows across the south part of the property. There are no NWI mapped wetlands in the area of the proposed mine development, however due to the scale of NWI mapping, it can't be concluded that there are no wetlands on the site.

A reconnaissance of the area proposed for development was conducted in October 2019. The purpose of this reconnaissance was to preliminarily identify wetland resources including wetlands and potential vernal pools, and the possible presence of small or intermittent streams. During the reconnaissance wetlands, potential vernal pools, and intermittent streams were observed. The results of the reconnaissance suggest that a detailed wetland and vernal pool survey of the proposed development area during the growing season was warranted.

In Spring of 2020 a detailed field delineation of wetlands and vernal pools was conducted. **Figure 6-1** shows the mapped wetland and vernal pools, existing site plan and conditions. The **Wetland Report** is provided in **Exhibit 7 – Attachment B**. The proposed Preliminary Site Plan along with the mapped wetlands, vernal pools and streams is shown on **Figure 2-1**. The figure shows how the proposed development can occur with no impacts to vernal pools, wetlands and streams including a 75-foot buffer on all such natural resources. It is Wolfden's aim to conserve and protect the wetlands and their ecological functions by avoiding impacts. The current development plan achieves this goal.

At the completion of the mining project, the site will be reclaimed removing all buildings and structures except the TMF. The final grading plan for this final phase of the project can be designed in a manner to enhance and create forested wetlands and associated vernal pool habitats in areas with appropriate hydrology within the footprint of the mine operational area.

Based on our current understanding of wetlands present at the site, the project will meet the goal of protecting the ecological functions of wetland resources, including vernal pools. Correspondence with the Maine Department of Inland Fisheries and Wildlife is provided in **Exhibit 25 – Attachment B.**

10.4.7 Forest Resources

Wolfdon currently owns 7,145 acres located in the southeastern corner of Township 6, Range 6 (T6R6). The property is entirely undeveloped and forested, except for six privately owned camps (seasonal residences) and logging/woods roads. The property has generated approximately \$300,000 in revenue annually from timber revenue. The Company entered into a timber harvest agreement in January 2020 to sell \$5 million of its timber over five years to a local timber company. Much of these proceeds will be used to advance the project. The timber industry is the primary industry in the area and is the driver of the local economy. The area proposed for rezoning is approximately 600.1 acres which includes approximately 122 acres of land that would be constructed upon or disturbed by construction. The mine is planned to operate for 10-15 years after which the impacted area would be restored. The mine operations area would be restored as forest and would eventually again be logged/harvested. The dry stacked tailings pile would be capped and restored/revegetated. The cap concepts will be developed during the final design. The cap is required to achieve the same permeability as the liner system. Other alternatives include long term management of vegetative growth on the cap, similar to a conventional landfill cap. There would be no restrictions on current and future timber operations on the remaining 6,499 acres of the property while the mine is in operation and being restored. The development associated with the proposed mine would affect less than 1.5% of the property currently in forest production. Therefore, impacts to the forest resources and timber industry would be negligible.

10.4.8 Water Resources (Surface water, Streams, Shallow Groundwater)

The property includes lakes, ponds, and streams, including Pleasant Lake, Pickett Mountain Pond, Mud Pond, west branch of the Mattawamkeag River. The area proposed for development however does not include any mapped streams or surface water bodies based on the USGS topographic map (i.e., Green Mountain, Maine). Although there are no USGS mapped streams within the area proposed for development, the area does include intermittent streams, too small to be picked up at the scale of the USGS maps. Intermittent streams and shallow groundwater were observed during the October 2019 reconnaissance and have been located as part of the wetland delineation conducted in 2020. Impacts to water resources would be avoided to the extent practicable and any impacts would be mitigated through restoration activities. In general impacts to water resources would be negligible based on the proposed treatment and discharge of water generated during mine operations, as discussed in the preceding sections. The excess water generated by the project operations, including mine infiltration water and precipitation catchment, will be treated and released back into the environment following all rules and best management practices and achieving requirements specific by the MEDEP Chapter 200 regulations. Excess water would be treated to background water quality and be routed to infiltration galleries that are not upgradient of wetlands if necessary, so that wetland hydrology water balances are not altered from baseline conditions.

10.4.9 Noise

Impacts to noise from the project was evaluated in November 2020 then revised and updated in April 2021 to include considerations and adjustments to the project layout by Buddy Ledger with Wood Environmental and Infrastructure Solutions.

The noise impacts associated with the project operations were assessed through predictive acoustic modelling. The sound level limits established in the Chapter 375.10 of the DEP regulations were used as the

criteria for the impact assessment. The acoustic assessment indicated that the noise levels from the Project operations are expected to meet the applicable DEP limits for daytime and nighttime. The complete technical memorandum is shown in **Exhibit 10 - Attachment B Technical Memorandum – Noise Assessment Report**.

10.4.10 Air Quality

In general, air quality surrounding the project is should not be impacted by the project and related activities. Sources of air quality impact related to the project will include, blasting gases, diesel particulate matter and dusts.

Blasting gases are most significantly controlled by high quality blasting practices to ensure total consumption of blasting components during blasts. In addition, regular blasting will occur infrequently. Twice per day between shifts.

Diesel particulates are produced through operating of heavy diesel equipment both underground and on surface. Majority of heavy equipment operating at the project will be located underground. All diesel engines will meet tier 4 criteria to ensure diesel particulate matter are scrubbed before discharging to the atmosphere. In addition, with the potential ability to generate clean onsite power, Wolfden is interested in evaluating the potential of operating an electric heavy equipment fleet that would further reduce diesel particulate matter emissions.

Dusts are the most significant impact to air quality surrounding the project site. Dusts produced on roadways will be manage by the operation of a water truck or by applying an approved dust suppression product to the roads surface. Dust control with relation to the tailing's facility will be managed daily as required, using water sprays and dust suppression reagents commonly used in municipal dirt roads and other applications requiring environmentally safe products, nominally produced from natural pine oils or similar. The simple water spray solution or combined with a pine oil-based product or similar is anticipated to be used on roadways or travel areas within the tailing's facility, which will have a very limited footprint and exposure area. Tailings previously deposited will have been dozed and compacted during normal operations, such that the surface is not prone to dusting. Once the tailings reach its final height, cover materials will be placed to mitigate dusting or contact with precipitation.

10.4.11 Management of Sewage Water, Mine Water, Process Water and Precipitation

10.4.11.1 Sewage Water

Human sewage generated from the underground mine operations will be contained to Portable Toilets (Porta Potties). These will be on contract basis and managed through replacement of filled facilities with clean facilities by the supplier. Grey and black waters generated from the surface facilities will drain to a typical state approved septic system located on the site down gradient of the building infrastructure and potable water supply. Sewage management is further discussed in **Exhibit 23**.

10.4.11.2 Mine Water, Process Water and Precipitation

As discussed above, project facilities have been sited to avoid any direct impacts to wetlands and surface waters. Additional measures are incorporated into the project design to ensure that (i) water from the facility is collected and treated to at or better than background water quality levels before discharge so that there will be no adverse impacts to water quality, and (ii) controlled discharges of treated water into strategically placed infiltration galleries will support the natural flux of water to wetlands and surface waters. These design measures avoid indirect impacts to natural water resources including groundwater, surface water

run-off and surface water. The key elements of the water management plan that ensures the project will not have indirect adverse impacts on ground and surface waters are discussed below.

Development of the Pickett Mountain mineral deposit will require collection of groundwater seepage for subsurface dewatering during underground mining operations and collection of surface water runoff from within the footprint of the developed property. These waters will be collected and stored to establish an initial process water volume sufficient to start up the site operations. Water will be collected and stored at a slow rate from ground water wells over the construction duration at an estimated rate of 3-5 gpm over a duration of 139 days or 0.38 years and therefore isn't expected to cause a cone of depression in the water table or impact surrounding hydrology.

During steady state operations, water from the mine (ground water seepage and water used in mining) and precipitation onto impacted areas throughout the site, will be collected and treated to within water discharge guidelines and rules that include at or better than background water quality. A portion of the treated water will be reused by the mine and concentrator. Any excess treated clean water will be returned to the environment as recharge via a system of infiltration galleries, similar to septic system leach fields. Water from the tailing's facility will be managed separately, collected in the respective tailings water collections ponds on and north and south sides of the tailing's management facility, then re-used in the concentrator as process water. Any excess water would be pumped to the pre-treatment water storage pond for holding, treatment, with subsequent holding and testing in the post water treatment pond, then discharged via the infiltration galleries. All elements of water management and flow directions are identified in **Figure 2-2 Grading Layout 1** . Red lines in the figure indicate influent water and the green lines indicate treated effluent water.

The estimated water balance from the milling/tailings facility is as follows resulting in a process water make up requirement of 166.93 cubic meters per day or 30.6 gpm. The table indicates the process peak rate of 1,300 tonnes per day operating rate. The planned operating rate is 1,200 tonnes per day and therefore this is a conservative approach.

Table 10-1: Concentrator Water Balance (Peak Flow Rate)

Product	Solids		Water t/d or m ³ /d	Water	Comments
	%	t/d		GPD (x1000)	
Plant Feed (Flotation Feed)	30	1,300	3,033.3	801	Need Per Day
Cu Conc.	80	20.15	5.04	1.3	Lost in Concentrate
Pb Conc.	80	13.78	3.45	0.9	Lost in Concentrate
Zn Conc.	80	64.35	16.09	4.3	Lost in Concentrate
Tailings	80	1,201.72	133.5	35.3	Lost in Tailings
Process Water Recycle	0	0	2,866.37	757.0	Amount Recovered
Process Makeup Water	0	0	166.93	44.1	Makeup Per Day

The overall site water balance is identified in the figure below. The diagram demonstrates that the concentrator continuously utilizes a net 94.5% of the water (757,000 gallons per day) that is introduced and recycled through the milling and tailings process circuit, including any added precipitation. Water immediately recycled into the process is conditioned through the process water conditioner. This is a carbon cylinder system for removing copper sulfate. A description of the need for this process is shown in **Attachment B – Prosolve Process Water Conditioning**. The remaining 5.5% or 44,000 gallons per day of water exits the concentrator as moisture in the concentrates and deposited tailings. Water removed from the concentrator remains interstitially in the concentrates and tailings and is considered lost. For the

purposes of the water balance, 10% of the water deposited with the tailings is assumed to seep out with precipitation then is collected and directed to the water treatment plant.

An estimated 50.2 gpm of impacted water from surface pads, a net 31.3 gpm of impacted water from the Concentrator/Tailings circuit and 64.67 gpm of impacted water discharged from the mine are pumped and collected into the pre water treatment pond. From the pond, water is reconditioned through a first phase of the treatment plant. The water treatment processes are explained in later sections of this Exhibit. After the first phase of treatment, a portion of the water is pumped back to the mine and mill for use as process water. Excess water not consumed by the mine and concentrator is sent to a second phase of water treatment (reverse osmosis). Once fully clarified, the clean water is then discharged into a post treatment clean water storage pond. The clean water remains in this pond until testing confirms it meets established discharge clean water quality specifications (at or better background groundwater conditions). Discharge of clean water entails pumping to the subsurface infiltration galleries for distribution into the ground. The byproduct water (reject water) from the water treatment plant, will be filter pressed to remove any solid particulate and then recycled through the treatment plant until cleaned. However, a portion of this water is selected for producing a cement slurry used for cemented rockfill binder. The solids are removed for disposal into the mine as backfill, if proven acceptable to the MDEP. Otherwise, the solid material will be collected and deposited to the tailings facility or shipped and disposed of off-site at an approved landfill. Any sulfide or gangue minerals remaining in that water are chemically stable due to the water treatment plant process which increases the pH of the water in order to precipitate out any metals in a sulfate form as opposed to a sulfide form. Sulfate minerals are very stable and will not dissolve back into solution. This ensures that minerals will not pass through the filtration and RO systems of the water treatment plant. If stabilized and deposited as backfill, no leaching is expected to occur from the backfill to underground water/groundwater since there is a lack of oxygen once saturated and will remain stored below the water table (no oxidation). During mine operations groundwater flows into underground void spaces as mine water seepage and not out into groundwater due to the inward hydraulic gradient (negative pressure differential).

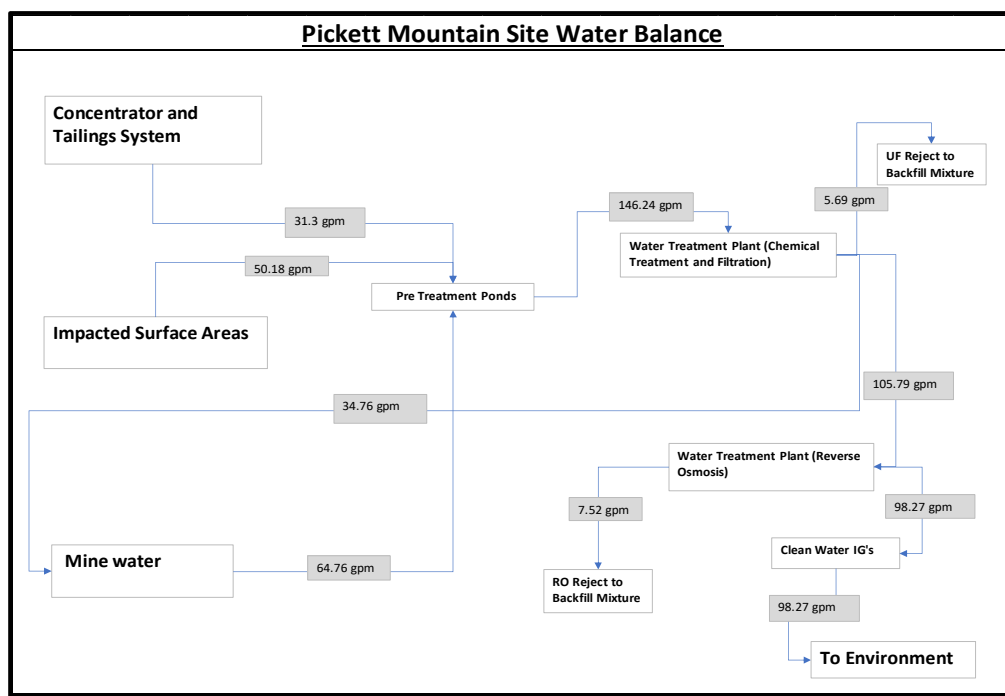


Figure 10-4: Overall Site Water Balance

Since the surrounding surface water bodies are of a class A designation, any water discharged from the project must be treated to meet background water quality. All water will be discharged subsurface into the ground via a series of infiltration galleries and not discharged directly into surface water bodies or to the ground surface. To better understand current ambient groundwater and surface water quality, a series of samples were collected from around the proposed project by Carol White and Associates in August 2018 and analyzed to assess water quality. **Figure 10-5** below indicates groundwater sampling locations. Surface water samples were collected from the upstream inlet of Pickett Mountain Pond and at the bridge on the access road where it crosses the outlet stream from Pickett Mountain Pond.

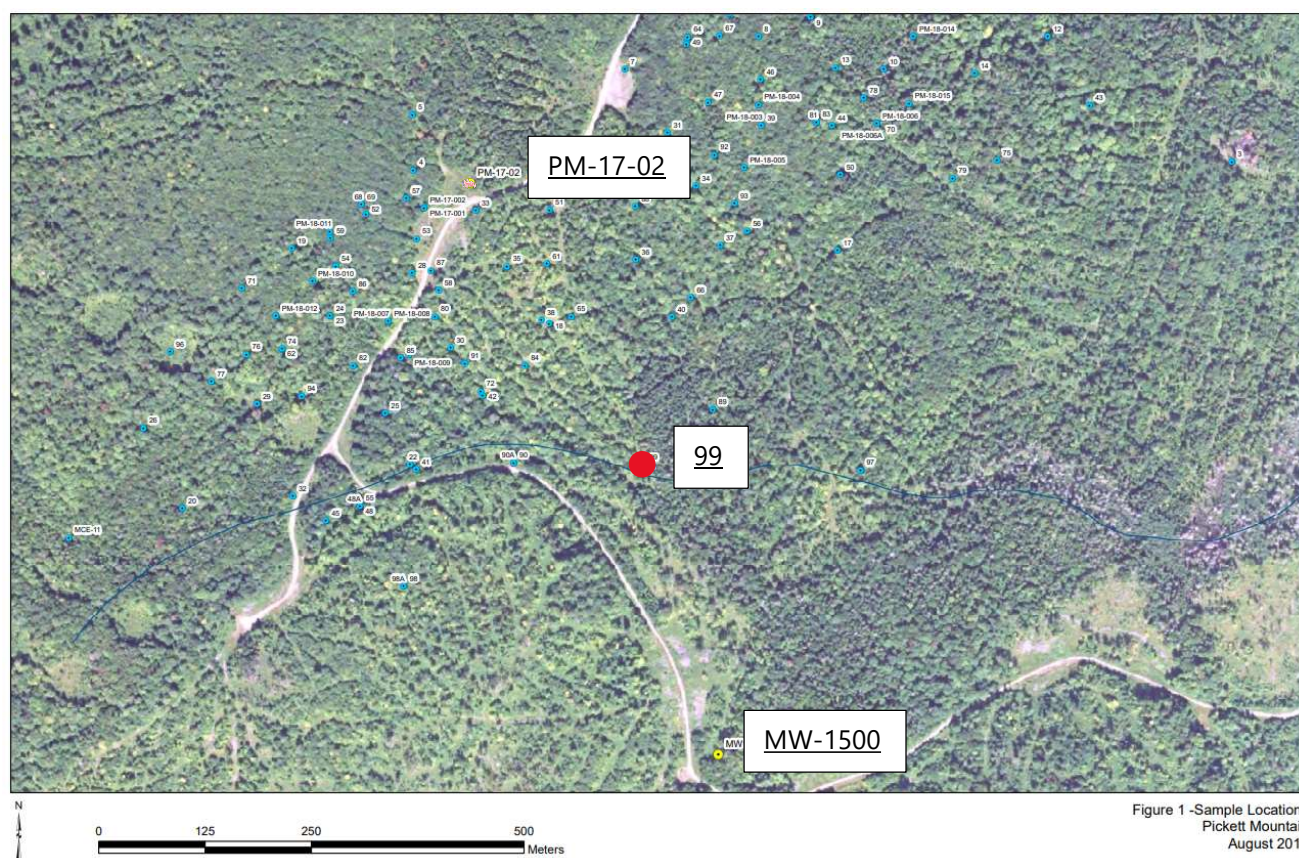


Figure 10-5: Underground Water Sampling Locations 2018

Results from the groundwater samples and surface water samples from the 2018 reconnaissance visits are included in the tables below. Although these results represent a small sample size, the analysis should fall within the range of values constituting an initial indication of ambient water quality. A rigorous two-year baseline sampling program is required under the Maine DEP Chapter 200 rules to statistically determine background water quality. Results of the August 2018 sampling event are presented in **Table 10-2**. Analytes detected above reporting limits are in bold text. Results below the reporting limit but above the method detection limit are not bolded and represent estimated (J qualified) concentrations. Sample results detected at a concentration greater than a maximum contaminant level (MCL) for groundwater or an ambient water quality criterion (AWQC) for surface water are in highlighted in red or maroon text, respectively.

Table 10-2: 2018 Groundwater Sample Results

						Groundwater Sample Location								
						Laboratory Results								
Parameter	Reporting Limit	Method Detection Limit	Units			PM-17--02		MW-1500 Shallow		MW-1500 Deep		DH-99		MCL
ALUMINUM	0.015	0.005	mg/L			0.04		0.028		0.075		0.059		-
ANTIMONY	0.005	0.002	mg/L			ND	U	ND	U	ND	U	ND	U	0.006
ARSENIC	0.005	0.002	mg/L			0.011		0.004	J	0.003	J	0.003	J	0.010
BARIUM	0.01	0.003	mg/L			0.059		ND	U	0.003	J	ND	U	2.0
BERYLLIUM	0.0006	0.0002	mg/L			ND	U	ND	U	ND	U	MD	U	0.004
CADMIUM	0.0006	0.0002	mg/L			0.0005	J	0.0002	J	0.0002	J	0.0003	J	0.005
CALCIUM	0.3	0.1	mg/L			25		15		20		16		-
CHROMIUM	0.005	0.002	mg/L			ND	U	ND	U	ND	U	ND	U	0.1
COPPER	0.003	0.001	mg/L			ND	U	ND	U	ND	U	ND	U	1.3
IRON	0.05	0.02	mg/L			1.6		0.03	J	0.03	J	0.07		-
LEAD	0.003	0.001	mg/L			ND	U	ND	U	ND	U	ND	U	0.015
MAGNESIUM	0.3	0.1	mg/L			3.40		2.6		3.4		1.7		-
MANGANESE	0.05	0.02	mg/L			0.38		ND	U	ND	U	ND	U	-
MERCURY	0.0005	0.0002	mg/L			ND	U	ND	U	ND	U	ND	U	0.002
MOLYBDENUM	0.015	0.005	mg/L			ND	U	ND	U	ND	U	ND	U	-
NICKEL	0.005	0.002	mg/L			ND	U	ND	U	ND	U	ND	U	-
POTASSIUM	0.3	0.1	mg/L			0.40		0.1	J	0.1	J	0.2	J	-
SELENIUM	0.005	0.002	mg/L			ND	U	ND	U	0.002	J	MD	U	0.05
SILVER	0.001	0.0003	mg/L			ND	U	ND	U	ND	U	ND	U	-
SODIUM	0.3	0.1	mg/L			3.70		2.5		1.6		1.3		-
THALLIUM	0.004	0.001	mg/L			0.00	J	ND	U	ND	U	ND	U	0.002
VANADIUM	0.01	0.003	mg/L			0.00	J	ND	U	ND	U	0.003	J	-
ZINC	0.005	0.002	mg/L			0.24		0.017		0.019		0.021		-
CHLORIDE	1	0.3	mg/L			0.64	J	0.7	J	0.62	J	0.84	J	-
FLUORIDE	0.1	0.03	mg/L			0.16		ND	U	ND	U	ND	U	4.0
SULFATE	2	0.6	mg/L			21.00		5.9		5.3		6.8		-
TOTAL CYANIDE	0.005	0.002	mg/L			ND	U	ND	U					0.2

Table 10-3: 2018 Surface Water Sample Results

Parameter	Reporting Limit	Method Detection Limit	Units	Surface Water Sample Location				CMC ¹	CCC ²
				Results µg/L				(acute)	(chronic)
				Pickett Pond -Inlet		Pickett Pond Outlet		(µg/L)	(µg/L)
ALKALINITY	2.5	0.7	MGCACO3/L	23000		2400	J	-	20000
TOTAL PHOSPHORUS	0.04	0.01	mg/L	20	J	10	J	-	-
ALUMINUM	0.015	0.005	mg/L	140		110		750	87
ANTIMONY	0.005	0.002	mg/L	ND	U	ND	U	-	-
ARSENIC	0.005	0.002	mg/L	4	J	4	J	340	150
BARIUM	0.01	0.003	mg/L	8.4	J	ND	U	-	-
BERYLLIUM	0.0006	0.0002	mg/L	ND	U	ND	U	-	-
CADMIUM	0.0006	0.0002	mg/L	0.33	J	0.26	J	1.8	0.72
CALCIUM	0.3	0.1	mg/L	4800		400		-	-
CHROMIUM	0.005	0.002	mg/L	ND	U	ND	U	570	74
COPPER	0.003	0.001	mg/L	ND	U	ND	U	-	-
IRON	0.05	0.02	mg/L	23000		200		-	1000
LEAD	0.003	0.001	mg/L	ND	U	ND	U	65	2.5
MAGNESIUM	0.3	0.1	mg/L	1100		300		-	-
MANGANESE	0.05	0.02	mg/L	400		30	J	-	-
MERCURY	0.0005	0.0002	mg/L	ND	U	ND	U	1.4	0.77
MOLYBDENUM	0.015	0.005	mg/L	ND	U	ND	U	-	-
NICKEL	0.005	0.002	mg/L	ND	U	ND	U	-	-
POTASSIUM	0.3	0.1	mg/L	360		100	J	-	-
SELENIUM	0.005	0.002	mg/L	ND	U	ND		-	-
SILVER	0.001	0.0003	mg/L	ND	U	ND	U	3.2	-
SODIUM	0.3	0.1	mg/L	1100		400		-	-
THALLIUM	0.004	0.001	mg/L	ND	U	ND	U	-	-
VANADIUM	0.01	0.003	mg/L	ND	U	ND	U	-	-
ZINC	0.005	0.002	mg/L	30.2		19.4		120	120
CHLORIDE	1	0.3	mg/L	330	J	620	J	860000	230000
FLUORIDE	0.1	0.03	mg/L	ND	U	ND	U	-	-
SULFATE	2	0.6	mg/L	1100	J	2200		-	-
TOC	2	0.7	mg/L	5300		5200		-	-

For the purposes of this petition, the ground and surface water results identified in the tables above are considered representative of ambient conditions and therefore establish a preliminary indication of discharge limits for effluent water quality. The full 2018 Environmental Reconnaissance Visit report by Carol White is provided in **Exhibit 10 - Attachment B Pickett Mountain Environmental Reconnaissance Visit August 2018**.

10.4.11.3 Water Management and Treatment

Precipitation that comes in contact with mineralized rock (ore, low grade ore, and waste rock) which is stored on lined pads will be collected for treatment. All process and seepage water used in the underground workings in the mine will also be collected. These mine impacted waters will be routed to the southeastern (down gradient) corner of the project site into a lined pre-treatment water storage pond designed to contain all water collected on the project site. Precipitation that falls within the tailings management facility and comes in contact with tailings will be directed to the north and south tailings ponds. Decant water from the tailings as well as the aforementioned precipitation that contacts tailings within the TMF will be pumped back to the concentrator as recycled process water. A series of run-on water control berms will be designed to route precipitation water outside of these areas to reduce contact with mine waste materials and minimize the volume of impacted water requiring treatment. Once the water is collected in the pre-treatment water storage pond, it is pumped to the water treatment facility and treated. Treated effluent is sent to a post treatment storage pond prior to being re-infiltrated. The technological state of water treatment is very advanced with filtration processes designed to adjust pH, remove metals and sulfates and produce a high-quality effluent to meet water quality discharge specifications (background water quality). The solid waste stream (solids) that is produced and extracted in this filtration process, is very stable (benign) and will not dissolve back into solution.

Water treatment includes a two step precipitation process, with a mix tank/mixer and chemical injection for each step. The first step includes the injection of sodium hydroxide to raise pH to 9-10, to facilitate metal-precipitation. The second polishing step further enhances the precipitation of any remaining metals with the addition of MetClear, a liquid polymer precipitation agent. The MetClear product is an inorganic of sulfur compounds, capable of precipitating complexed and uncomplexed metal ions. It is effective over a wide pH range (pH 4-14) and has an extremely low aquatic toxicity. Suez, the potential treatment plant manufacturer, suggests these two processes would be enough to remove metals, to at or below water quality discharge requirements. As a matter of prudence, a reverse osmosis unit has been designed into the treatment facility as a potential third step in the treatment train, in case it is required. Equipment utilized in these processes includes ultra-filtration (UF), a M-52 UF skid in a 8'x40' ISO (International Organization for Standardization) container (C-Container), to filter precipitated metals and other solids down to 0.04-micron nominal levels. The M-52 skid includes; 2 trains comprised of a membrane tank, permeate pump, blowers, clean in place (CIP)/backpulse tank and pump, and controls for operations. The CIP system is designed within the plant for cleaning the interior of pipes and vessels as well as reverse osmosis and micro filtration systems without having to remove them and clean them manually. Any reagents used in the CIP do not pass through the RO system as the system is flushed thoroughly until only cleaned water is present at the RO. A letter from Suez confirming this is shown in **Exhibit 10 - Appendix B Wolfden Cleaning Chemicals**. A coagulant will be added to the feed of the M-52 skid to help with membrane maintenance. Additional chemicals will be provided for cleaning the UF membranes. The treatment plant includes a solids handling/dewatering system to treat the UF backpulse material to allow for disposal of the solids and recycling of the water/supernatant. The dewatering system will include a cone bottom sludge holding tank, an ISO container with a polymer injection system, mixing tank, rotary fan press, sump/pump, and conveyor. A roll-off dumpster will be used for receiving any solids for final disposal.

The water treatment plant will be operated by the supplier using skilled professional water treatment plant operators while training local operators. This will ensure that operation and fine tuning of plant operation will take place quickly and ensure the required high quality clean water output post commissioning of the plant.

The overview of the water treatment plant is shown below and in **Exhibit 10 - Attachment B 428090 – Wolfden Pickett Mt Mine WWTP LTSA (Budgetary Letter)** as well as an associated letter of guarantee from the supplier (**Exhibit 10 - Attachment B Wolfden Process Guarantee**). The treated effluent may then be recharged to groundwater with no chemical or mineral impacts via the subsurface infiltration galleries. Recharge of treated clean effluent to groundwater is also protective of surface waters that eventually receive groundwater.

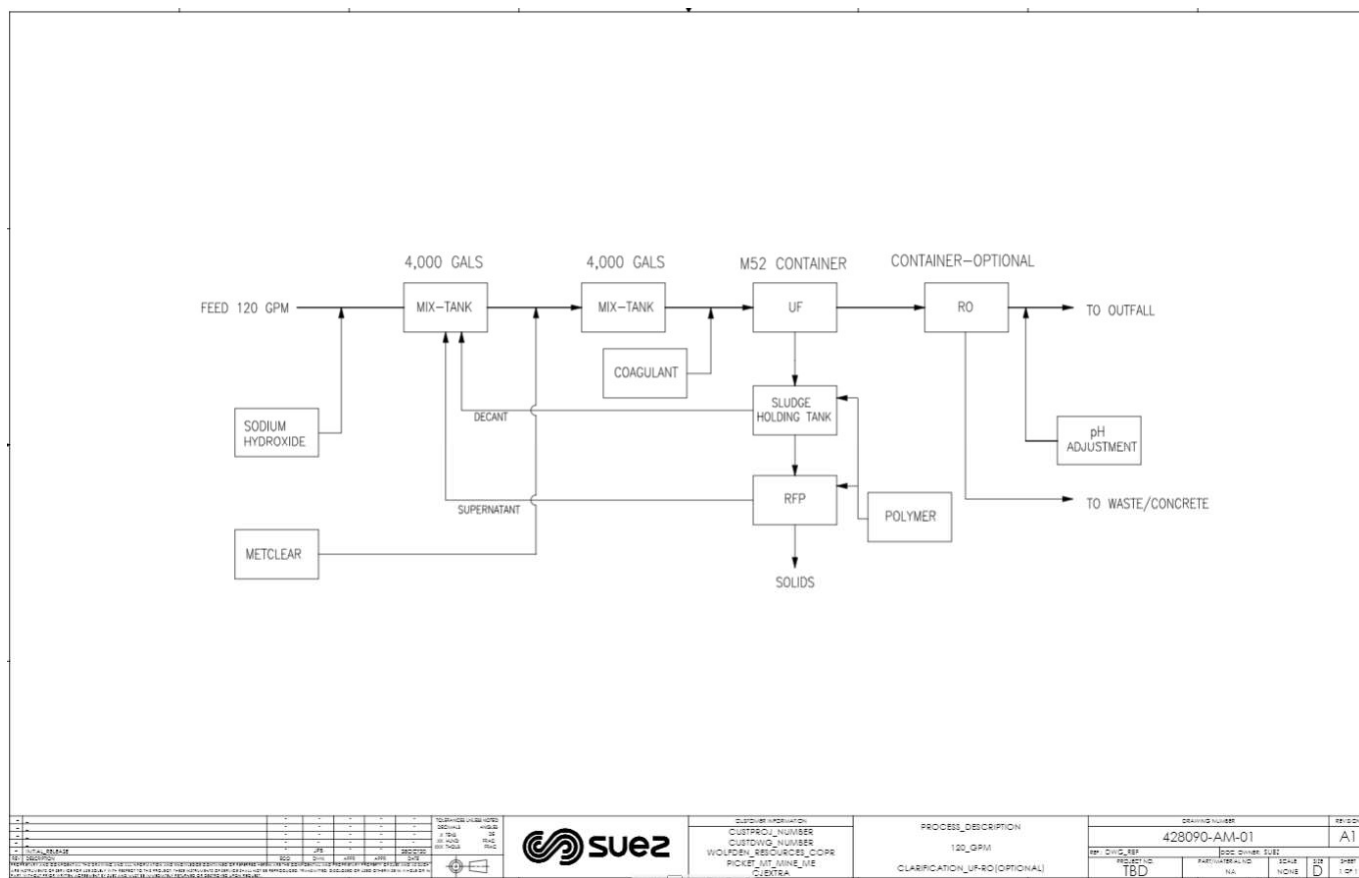


Figure 10-6: Water Treatment Plant Process Diagram

Notes:

EQ= Equalization (Tank); RO= Reverse Osmosis, BW= Backwash, RFP = Filter Press, Outfall = Post Treatment Water Storage Pond

The treatment plant will be operated in accordance with an operations and maintenance plan that will specify storage and management of chemical reagents and actions to be taken to prevent spills and accidental releases and to address spill clean-up and reporting should an accidental spill occur.

The plant is designed for 200 gpm. This is based on a full site water balance requirement as shown in **Figure 10-44**. Storm events are managed by storing collected waters for treatment in the lined ponds. Ponds are sized to accept a 24hr-500-year storm event which can then be drawn down by the water treatment plant over a longer period. This protects against oversizing the plant but also to ensure that any clean water released to the environment is in a controlled manner. In addition to this conservative design, Suez has a large inventory of mobile plants that they are able to mobilize immediately to the project site in case additional water treatment is required or act as a backup to any existing facilities.

Metclear MR2435 is a proprietary polymeric reagent designed specifically for precipitation and settling of dissolved metals in water as an early step in water treatment. The material safety datasheet for Metclear is shown in **Exhibit 10 - Appendix B Safety Data Sheet METCLEAR* MR2435**. The impact of Metclear on metals removal from raw unfiltered (UF) water is shown in the chart below.

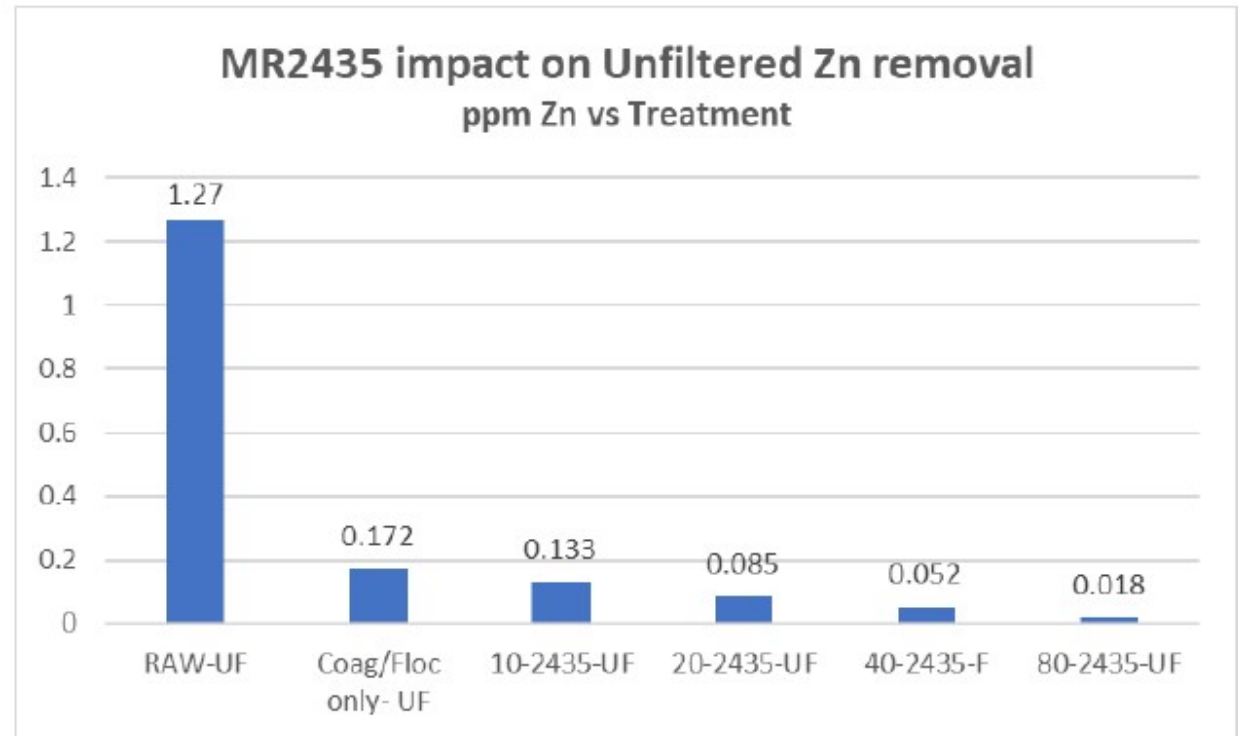


Figure 10-7: Effect of Metclear2435 Addition on Zn Removal

The column labels in the figure above reference the percent addition of the metclear reagent followed by ultra filtration (i.e. 10-2435-UF = 10% - Metclear2435 reagent – Ultrafiltration). Raw-UF indicates no chemical addition prior to ultrafiltration and Coag/Floc only indicates the use of none Metclear treatment product. Note that results in the figure do not include reverse osmosis after ultra-filtration and that the zinc removal is near target without the RO addition.

Metals including cadmium, cobalt, copper, lead, mercury, nickel and zinc, as shown, are effectively removed with the use of MetClear as a treatment reagent. In addition, the treatment train includes an ultra-fine filtration system and a reverse osmosis system. For further clarification, the addition of MetClear pulls the metals of interest, including those associated with sulfur (sulphide minerals), out of the influent and precipitates them as sulphate solids that are captured by the filters, in the form of a filter cake. The creation of the sulphate filter cake eliminates the future risk of those metals from ever dissolving back into groundwater or generating any form of acid.

Suez has estimated that the overall continuous treatment process will generate a 90% clean effluent and 10% reject back to the front of the influent stream for retreatment after solids have been removed using a polymer and pressed into a filter cake. The non-soluble (benign) filter cake will be inert and should meet any required approvals to be included as an addition to the rock backfill in the underground mine openings. Otherwise, the filter cake will be deposited along with the tailings on the dry stack tailings facility or disposed of to an approved waste management facility.

The intent of treated water is to be first recycled for process water where required by the mine and concentrator then excess water discharged to the environment via infiltration galleries. Given that all residual chemicals are removed by the plant and specifically the RO system, no risk to workers using treated water as process water will be present due to quality of the treated water.

A letter of guarantee to meet the expected clean water quality standards is supplied by Suez is show in **Exhibit 10 - Attachment B Wolfden Process Guarantee.**

10.4.11.4 Water Treatment Modeling

Water treatment modeling of major cations, select metals, and anions has also been completed by Suez to enhance our understanding of and provide technical confidence in the projects ability to treat to and meet the strict project water discharge regulations. For the purposes of this evaluation we have used "indicated ambient" water quality levels-based analysis of site –specific water collected by Carol White and Associates, since statistically derived background water quality concentrations for site have yet to be established and approved by MDEP (These will be established during the baseline characterization study required as part of the MDEP Chapter 200 Mining permit application). The modeling does not account for trace heavy metals nor base metals, but these data do provide an indication of dry stack tailing water quality. The degree of treatment for the major cations and other metals should be generally indicative of removal rates for other metals not modeled. The following series of tables provide details of computer aided modelling based on a real world mine example that is comparable to the proposed project. The Suez model was performed using Winflows Version 3.3.3.

Greens Creek is a project site located in Alaska and is an underground base metal mine that has been operating with a dry stack tailings facility. Although this project site has undergone significant changes in tailings management over its history, the example was selected for water input since the mining, milling and current tailings deposition strategies are similar to those proposed at Pickett Mountain. The water sample analytical results from the tailings facility are shown in the following **Table 10-4**. Of the two samples taken from tailings water collection ditches, the maximum (or worst water quality) was utilized for modelling in Winflow and used for other comparisons later in this section. Using this worst quality input water ensures a conservative approach to water treatment modelling and comparisons.

Table 10-4: Greens Creek Project Tailings Water Samples

Greens Creek Alaska		West Buttress Ditch 9/7/01	South Toe Ditch 9/7/01		
Parameter	Parameter	Value	Value	Maximum Values	Units
<u>Field pH</u>	<u>pH</u>	<u>6.94</u>	<u>7.6</u>	<u>7.6</u>	<u>su</u>
<u>TDS</u>	<u>Total Dissolved Solids</u>	<u>1900</u>	<u>2600</u>	<u>2600</u>	<u>mg/l</u>
<u>SO4</u>	<u>Sulfate</u>	<u>1330</u>	<u>1800</u>	<u>1800</u>	<u>mg/l</u>
<u>Ca</u>	<u>Calcium</u>	<u>382</u>	<u>427</u>	<u>427</u>	<u>mg/l</u>
<u>Mg</u>	<u>Magnesium</u>	<u>90</u>	<u>185</u>	<u>185</u>	<u>mg/l</u>
<u>Hardness</u>	<u>Hardness</u>	<u>1320</u>	<u>1830</u>	<u>1830</u>	<u>mg/l</u>
<u>Na</u>	<u>Sodium</u>	<u>11.2</u>	<u>9.8</u>	<u>11.2</u>	<u>mg/l</u>
<u>K</u>	<u>Potassium</u>	<u>8.3</u>	<u>10.5</u>	<u>10.5</u>	<u>mg/l</u>
<u>Cl</u>	<u>Chlorine</u>	<u>4.8</u>	<u>10.2</u>	<u>10.2</u>	<u>mg/l</u>
<u>P</u>	<u>Phosphorus</u>	<u>0.159</u>	<u>0.19</u>	<u>0.19</u>	<u>mg/l</u>
<u>PO4</u>	<u>Phosphate</u>	<u>0.0524</u>	<u>0.028</u>	<u>0.0524</u>	<u>mg/l</u>
<u>NO3</u>	<u>Nitrate (NH3)</u>	<u>3.43</u>	<u>0.218</u>	<u>3.43</u>	<u>mg/l</u>

<u>SiO2</u>	<u>Silicon Dioxide</u>	<u>2.82</u>	<u>2.57</u>	<u>2.82</u>	<u>mg/l</u>
<u>Al</u>	<u>Aluminum</u>	<u>0.29</u>	<u>0.388</u>	<u>0.388</u>	<u>mg/l</u>
<u>Ag</u>	<u>Silver</u>	<u>0.00442</u>	<u>0.001</u>	<u>0.00442</u>	<u>mg/l</u>
<u>As</u>	<u>Arsenic</u>	<u>0.0063</u>	<u>0.00275</u>	<u>0.0063</u>	<u>mg/l</u>
<u>Ba</u>	<u>Barium</u>	<u>0.0176</u>	<u>0.018</u>	<u>0.018</u>	<u>mg/l</u>
<u>Cd</u>	<u>Cadmium</u>	<u>0.0398</u>	<u>0.0365</u>	<u>0.0398</u>	<u>mg/l</u>
<u>Cu</u>	<u>Copper</u>	<u>0.0063</u>	<u>0.0122</u>	<u>0.0122</u>	<u>mg/l</u>
<u>Cr III</u>	<u>Chromium</u>	<u>0.00119</u>	<u>0.00158</u>	<u>0.00158</u>	<u>mg/l</u>
<u>Fe</u>	<u>Iron</u>	<u>0.1</u>	<u>0.1</u>	<u>0.1</u>	<u>mg/l</u>
<u>Hg</u>	<u>Mercury</u>	<u>0.00001</u>	<u>0.00001</u>	<u>0.00001</u>	<u>mg/l</u>
<u>Mn</u>	<u>Manganese</u>	<u>1.92</u>	<u>3.18</u>	<u>3.18</u>	<u>mg/l</u>
<u>Mo</u>	<u>Molybdenum</u>	<u>0.00585</u>	<u>0.00591</u>	<u>0.00591</u>	<u>mg/l</u>
<u>Ni</u>	<u>Nickel</u>	<u>0.318</u>	<u>0.204</u>	<u>0.318</u>	<u>mg/l</u>
<u>Pb</u>	<u>Lead</u>	<u>0.351</u>	<u>0.0772</u>	<u>0.351</u>	<u>mg/l</u>
<u>Se</u>	<u>Selenium</u>	<u>0.0252</u>	<u>0.00427</u>	<u>0.0252</u>	<u>mg/l</u>
<u>Sb</u>	<u>Antimony</u>	<u>0.0263</u>	<u>0.0124</u>	<u>0.0263</u>	<u>mg/l</u>
<u>Zn</u>	<u>Zinc</u>	<u>16.4</u>	<u>11.9</u>	<u>16.4</u>	<u>mg/l</u>
<u>Alkalinity</u>	<u>Alkalinity</u>	<u>49</u>	<u>110</u>	<u>110</u>	<u>mg/l</u>
<u>Field Conductivity</u>	<u>Conductivity</u>	<u>2150</u>	<u>2730</u>	<u>2730</u>	<u>uS/cm</u>
<u>B</u>	<u>Boron</u>	<u>0.1</u>	<u>0.1</u>	<u>0.1</u>	<u>mg/l</u>
<u>DOC</u>	<u>Dissolved organic carbon</u>	<u>1.24</u>	<u>2</u>	<u>2</u>	<u>mg/l</u>
<u>F</u>	<u>Fluorine</u>	<u>0.29</u>	<u>0.304</u>	<u>0.304</u>	<u>mg/l</u>
<u>TSS</u>	<u>Total Suspended Solids</u>	<u>67</u>	<u>29</u>	<u>67</u>	<u>mg/l</u>
<u>Temp</u>	<u>Temperature</u>	<u>14.8</u>	<u>14.8</u>	<u>14.8</u>	<u>C</u>

Table 10-5 summarizes the treatment model input water quality data (influent). As noted, the input data for Winflow is derived from the tailing's samples above for major cations, specific metals and anions. The reverse osmosis modelling in Winflow was performed at a 100gpm flowrate. This model was performed to test the technologies against potential concentrated feed waters to the plant. The flow rate is that of a similar large-scale plant which has been accounted for in the small-scale Suez designs and this petition.

Table 10-5: Suez Water Treatment Model Input Data Summary

SUEZ Water Technologies & Solutions			
Winflows Version 3.3.3		DataBase Version 3.21	
Input Data Summary			
Project Information			
Project Name	Wolfden Picket Mine		
Engineer			
Location			
Mail ID			
Phone No.			
Comments			
Flowsheet Configuration			
Flowsheet Type	Single Pass Flowsheet	Feed Dosing	No
Feed Stripping	No	AfterFeed Dosing	No
Product Stripping	No	Product Dosing 1	No
Raw Feed Bypass	No	Product Dosing 2	No
RO1 to RO1 Recycle	No	Interpass Pumping	
RO2 to RO2 Recycle		PreProduct Pumping	
RO2 to RO1 Recycle		RO3 to RO1 Recycle	
RO3 to RO3 Recycle			
Feed Information			
Temperature, C	15.00	RO-1: 15.00	
Feed pH :	7.60	Silt Density Index :	4.00
Feed Stream Composition(mg/l): Source - Brackish Surfacewater (Conventional)			
Calcium (Ca)	427.00	Sulfate (SO4)	1800.00
Magnesium (Mg)	185.00	Chloride (Cl)	10.00
Sodium (Na)	20.00	Fluoride (F)	0.30
Potassium (K)	11.00	Nitrate (NO3)	0.20
Ammonia - N (NH4)	0.00	Bromide (Br)	0.00
Barium (Ba)	0.02	Phosphate (PO4)	0.05
Strontium (Sr)	0.00	Boron (B)	0.10
Iron (Fe)	0.10	Silica (SiO2)	3.00
Manganese (Mn)	0.00	Hydrogen Sulfide (H2S)	0.00
		Bicarbonate (HCO3)	145.41
		Carbon Dioxide (CO2)	5.04
		Carbonate (CO3)	0.42
Flow Rate Specifications			
Product Flow:	100.00 gpm		

Table 10-6 summarizes the treatment model outputs where the feed is the influent, the product is the clarified water, and the concentrate (conc) is the reject water that will be dewatered to a filter cake and disposed. As noted above, roughly 25% of the total balance reports to concentrate. However, a significant portion of the concentrate stream is dewatered and returned to the influent of the plant. Only a small portion of the concentrate stream (10% overall) is then removed from the plant for disposal.

Table 10-6: Suez Water Treatment Model Results Summary

SUEZ Water Technologies & Solutions									
Winflows Version 3.3.3					DataBase Version 3.21				
Results Summary									
Flow Data		gpm		Analytical Data		mg/L			
Raw Feed:		133.33		Raw Feed TDS		2659.78			
Product:		99.99		Product TDS		30.79			
Concentrate:		33.34		Concentrate TDS		10540.01			
System Data									
Temperature:		C	RO-1: 15.00				System Rec.		75.00%
Average Flux (gfd), Pass and Stage									
Pass	Average			Stage 1	Stage 2	Stage 3			
Pass 1	10.96			12.05	10.46	8.67			
Array Data									
									Pass 1
Recovery %:	75.00	Conc. TDS(mg/l):		10540.01		Conc. Flow:		33.34 gpm	
Stage	Total		Element Type	Flow, gpm		Pressure, psi		Perm TDS	
	Housing	Element		Feed	Perm	Feed	DP	mg/l	
	1	3	18 AG8040F	133.33	54.99	195.18	14.90	19.01	
	2	2	12 AG8040F	78.34	31.81	180.28	12.42	36.74	
	3	1	6 AG8040F	46.53	13.19	167.86	17.73	65.66	
Total		6	36						
Analytical data									
	mg/l					mg/l			
Cation	Product	Feed	Conc		Anion	Product	Feed	Conc	
Ca	4.45	427.00	1694.12		SO4	18.89	1800.00	7141.10	
Mg	1.96	185.00	733.88		Cl	0.26	10.00	39.22	
Na	1.49	77.19	304.20		F	0.01	0.30	1.18	
K	0.25	11.00	43.24		NO3	0.03	0.20	0.72	
NH4	0.00	0.00	0.00		Br	0.00	0.00	0.00	
Ba	0.00	0.02	0.08		PO4	0.00	0.05	0.20	
Sr	0.00	0.00	0.00		B	0.06	0.10	0.21	
Fe	0.00	0.10	0.40		SiO2	0.06	3.00	11.82	
Mn	0.00	0.00	0.00		H2S	0.00	0.00	0.00	
TDS mg/l	30.79	2659.78	10540.01		HCO3	3.33	145.41	564.55	
pH	6.06	7.60	7.94		CO2	5.36	5.04	6.52	
					CO3	0.00	0.42	5.10	
Saturation Data									
BaSO4 %	1.90	357.98	1719.53		CaF2 %	0.00	2.34	80.88	
CaSO4 %	0.28	82.17	453.09		SiO2 %	0.04	2.39	9.37	
SrSO4 %	0.00	0.00	0.00		LSI	-3.85	0.47	1.58	
Struvite %	0.00	0.00	0.00		Pi psi	0.22	11.18	39.20	

The results from the Winflow modelling indicates approximately 99 % reduction for most major cations and sulfate based on the influent feed from a project similar to the proposed Pickett Mountain project. If these treatment rates are applied to other metals the waters can be treated to achieve concentrations in the range of the 2018 ambient surface water quality using only ultra-filtration and reverse osmosis. The proposed plant is able to increase its ability to remove chemicals and minerals due to the addition of chemical treatment upfront in order to precipitate and settle out minerals before even arriving at the reverse osmosis step of treatment. In conclusion, the designed water treatment facility is sufficient to achieve the expected

water quality discharge requirement of the project and under such conditions would not pose a restriction to the proposed project.

10.4.11.5 Water Treatment Examples

Water treatment technology has developed significantly over recent decades and although the above modelling indicates that the proposed treatment plant is sufficient to achieve ambient surface water quality levels or better, this section provides a series of real-life examples of poor-quality water being treated to similar water quality as required at Pickett Mountain.

The table below, summarizes how effective a UF and RO combination is on a full list of analytes WITHOUT the addition of pretreatment reagents. This approach is conservative in nature because the installed water treatment plant will have an additional upfront chemical treatment used to precipitate and settle out metals and minerals before flowing into the ultrafiltration and reverse osmosis treatment components.

10.4.11.6 Halfmile Example – New Brunswick

The following tables summarize groundwater variances for a full list of elements and characteristics in groundwater surrounding the Halfmile Mine owned by Trevali Mining Corporation located West of Miramichi, NB. The Halfmile operation does not include a concentrator or tailings facility, but this example is included for two reasons. The first is that it proves that mine water can be treated to the levels required for Pickett Mountain regardless of the source. Considering the water balance above, majority of the water feeding the water treatment facility will come from underground and surface precipitation sources. The addition of a small percent of tailings water will not materially impact the performance of the water treatment facility. The second is that discharging treated water into a series of infiltration galleries was successful without impacting surrounding surface water bodies and groundwater that included a world class salmon river.

Sampling at Halfmile was completed by the mine site environmental team; typically, a senior level environmental engineer or environmental engineering student. Samples were collected using lab provided sampling guidelines then packed and sent to a laboratory for analysis by RPC Science and Engineering (Research and Productivity Council). RPC is a certified laboratory based in Fredericton, New Brunswick. It can be noted in this example that certain non-targeted and non-harmful minerals that may be higher than indicated ambient levels can be rectified with the addition of a reverse osmosis system downstream of the chemical treatment facility proposed for Pickett Mountain. The mechanical type of filtration can draw these final minerals from the water and ensure the final treated quality is equal to or better than the expected indicated ambient quality at Pickett Mountain. Confirmation of this by Suez, a recognized water treatment plant provider, is shown in **Attachment B – Suez Halfmile Analytes**.

The Halfmile sampling locations are identified in the following map. The sampling locations were chosen to surround the project site with additional specific interest in upstream groundwater from surface water bodies.

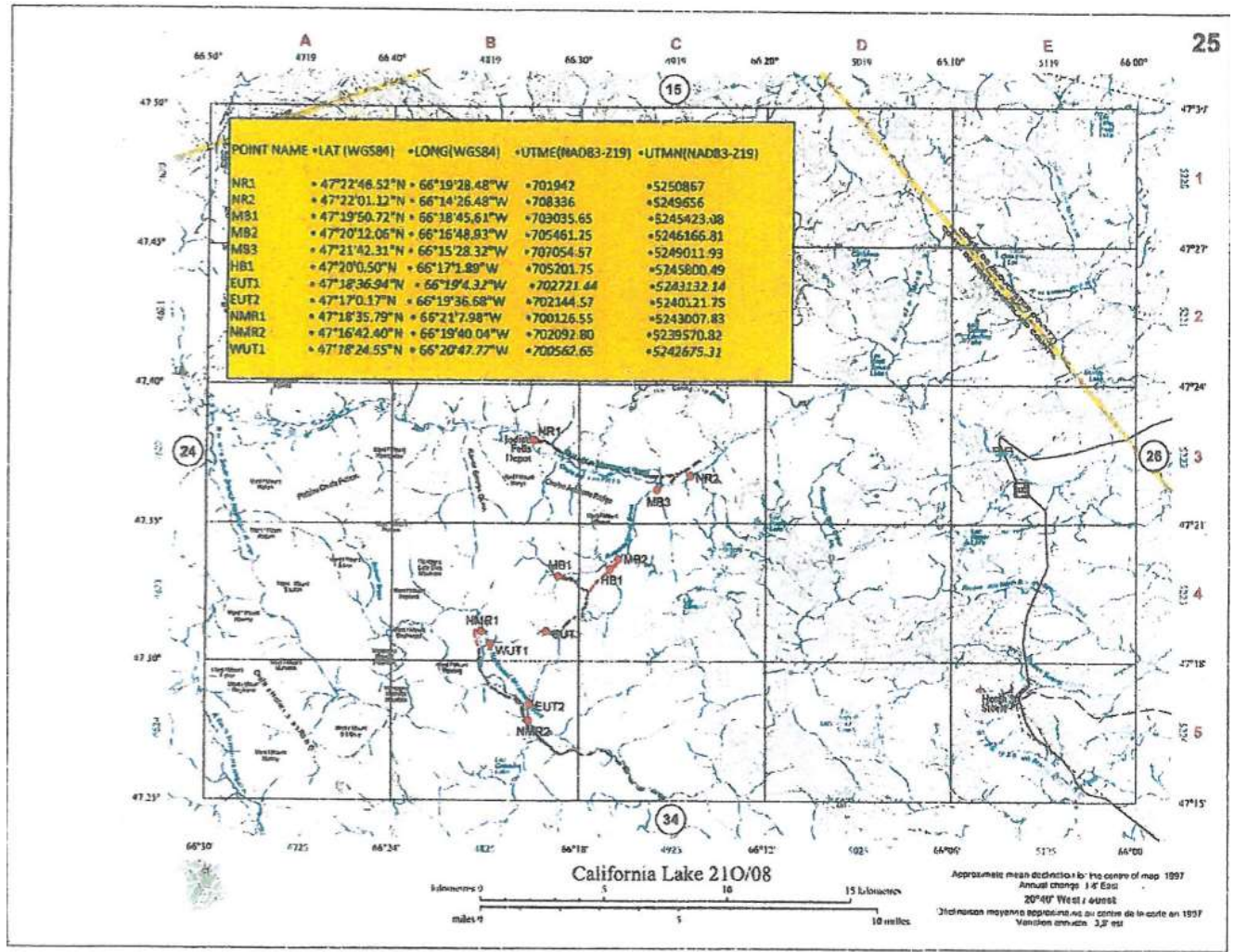


Figure 10-8: Halfmile Water Sampling Locations

Testing was performed before the project was initiated and continued throughout construction, operations and well after the project was put into care and maintenance. Results shown in the tables below, indicate a general improvement in groundwater quality with respect to the focus minerals over the duration between 2011 and 2019. It is noted that calcium, magnesium, potassium and sodium increased in concentration between 2011 and 2019. These minerals were not restricted by New Brunswick standards and therefore were not a focus of treatment through the water treatment facility. The water treatment facility at Halfmile was a chemical treatment process only and did not include the ultra-filtration or reverse osmosis systems currently proposed at Pickett Mountain. The introduction of a more robust treatment facility like the one proposed at Pickett Mountain, will ensure these are removed as required from the water to indicated ambient levels or better. This has been confirmed by Suez in **Attachment B – Suez Halfmile Analytes**.

Halfmile Mine Analysis of Metals in Water		Ground Water Well											
Sample Identification		327776-1	327776-2	327776-3	327776-4	125083-1	125083-3	125083-4	125083-2	Variance	Variance	Variance	Variance
Well Identification		MB-1	MB-3	HB-1	MB-2	MB1	MB3	HB1	MB2	MB1	MB3	HB1	MB2
Date Sampled:		28-Aug-19	28-Aug-19	28-Aug-19	28-Aug-19	7-Sep-11	7-Sep-11	7-Sep-11	7-Sep-11	NA	NA	NA	NA
Analytes	Units												
Aluminum	µg/L	3	17	24	27	8	43	56	44	-5	-26	-32	-17
Antimony	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Arsenic	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Barium	µg/L	2	3	3	3	2	2	3	2	0	1	0	1
Beryllium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Bismuth	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Boron	µg/L	2	0	0	1	1	1	2	1	1	-1	-2	0
Cadmium	µg/L	0.02	0	0	0	0	0	0	0	0.02	0	0	0
Calcium	µg/L	6250	8620	8230	8490	4910	6900	6770	6780	1340	1720	1460	1710
Chromium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Cobalt	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Copper	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Iron	µg/L	0	20	30	30	0	60	90	60	0	-40	-60	-30
Lead	µg/L	0	0	0	0	0	0.1	0.1	0	0	-0.1	-0.1	0
Lithium	µg/L	0.1	0	0	0	0	0	0	0	0.1	0	0	0
Magnesium	µg/L	840	900	1040	900	630	790	910	780	210	110	130	120
Manganese	µg/L	0	4	10	9	0	5	9	6	0	-1	1	3
Mercury	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Molybdenum	µg/L	0	0.2	0.1	0.1	0.1	0	0	0.1	-0.1	0.2	0.1	0
Nickel	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Potassium	µg/L	430	380	430	380	370	320	350	320	60	60	80	60
Rubidium	µg/L	0.2	0.5	0.4	0.5	0.2	0.3	0.3	0.3	0	0.2	0.1	0.2
Selenium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Silver	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	µg/L	2190	1610	1750	1680	1730	1400	1380	1400	460	210	370	280
Strontium	µg/L	22	25	24	25	15	18	18	18	7	7	6	7
Tellurium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Thallium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Tin	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Uranium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Zinc	µg/L	3	1	2	1	0	2	0	2	3	-1	2	-1

Halfmile Mine Groundwater Metals Variance September 2011 – August 2019

Halfmile Mine Water Chemistry Analysis		Ground Water Well											
Sample Identification		327776-1	327776-2	327776-3	327776-4	125083-1	125083-3	125083-4	125083-2	na	na	na	na
Well Identification		MB-1	MB-3	HB-1	MB-2	MB1	MB3	HB1	MB2	MB-1	MB-3	HB-1	MB-2
Date Sampled:		28-Aug-19	28-Aug-19	28-Aug-19	28-Aug-19	7-Sep-11	7-Sep-11	7-Sep-11	7-Sep-11	NA	NA	NA	NA
Analytes	Units												
Ammonia (as N)	mg/L	0	0	0	0	0	0	0	0	0	0	0	0
pH	units	7.5	7.5	7.5	7.5	7	7.1	7.1	7.1	0.5	0.4	0.4	0.4
Acidity (as CaCO ₃)	mg/L	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	mg/L	4	0	0	0	0	0	0	0	4	0	0	0
Solids - Total Suspended	mg/L	0	0	0	0	0	0	0	0	0	0	0	0
Conductivity	µS/cm	54	62	60	60					54	62	60	60
Hardness (as CaCO ₃)	mg/L	19.1	25.2	24.8	24.9	14.9	20.5	20.6	20.2	4.2	4.7	4.2	4.7

Halfmile Mine Groundwater Chemistry Changes from September 2011 – August 2019

10.4.11.7 Hardrock Mining Example Including Concentrator and Tailings

An example from Suez for one of its clients, (who elected to remain confidential), was evaluated for performance and to calculate percent removal of a detailed list of analytes. The treatment plant includes ultra-filtration and reverse osmosis. For this reason, the example remains conservative as it does not include the additional upfront precipitation and settling of minerals processes as those proposed in the Pickett Mountain facility. In the following analysis, the effect of influent water treatment using an operating Suez water treatment facility is shown. The equivalent effects on treating theoretical Pickett Mountain water are then calculated. This was completed by using the Greens Creek influent quality multiplied by the percent

removal in the Suez example to produce a calculated effluent quality. The effluent quality was then compared to the maximum ambient water quality data at Pickett Mountain. The positive results are shown in the following tables. A comparison of the results to the ambient water quality around Pickett Mountain project suggests that this technology even without upfront chemical precipitation treatment is sufficient for treating water a Pickett Mountain and achieving a concentration that is within the range of ambient water quality at Pickett Mountain. Once the base line water quality study is conducted, it is likely that the current maximum detected concentrations will be below the 95% upper concentration limit (UCL) of the mean which will be used to statistically define background. Therefore, if a predicted value is currently within the range of 2018 ambient water quality it will likely be below background when background is established statistically.

Table 10-7 shows the details of the influent quality. The effluent column describes the quality of the same water after treatment through the Suez plant. From the two columns, the % removal is calculated. The percent removal is the amount of each analyte that is removed from the influent stream during treatment processes. As noted in the far-right column, a significant number of analytes were below the detection limit of the lab. In those cases, 1/2 of the given detection limit was applied to estimate removal efficiency. In many cases this may artificially result in a lower % removal than actually occurs.

Table 10-7: Suez Example of UF and RO Performance

Suez Example					
Parameter	Units	Influent	Effluent	% Removal	Notes
pH	-	5.9	5.2	na	-
Temperature	Deg C	-	-	na	-
Alkalinity "P" as CaCO ₃	mg/l	1	1	na	1/2 of Detection Limit Applied
Alkalinity "M" as CaCO ₃	mg/l	11.9	2.2	82%	-
Chloride as CL	mg/l	55.2	1	98%	-
Fluoride as F	mg/l	3.5	0.2	94%	-
Nitrate as NO ₂	mg/l	5	0.5	90%	1/2 of Detection Limit Applied
Dissolved Organic Carbon C	mg/l	3.4	0.5	85%	-
Total Organic Carbon C	mg/l	3.6	0.5	86%	-
Turbidity NTU	NTU	5.3	0.1	98%	-
Nitrite as NO ₂	mg/l	0.1	0.1	0%	1/2 of Detection Limit Applied
Phosphate as PO ₄	mg/l	1	0.1	90%	1/2 of Detection Limit Applied
True Color (Color Units)	Color Units	1	0.5	50%	1/2 of Detection Limit Applied
Specific conductance at 25 deg C	umhos	10200	65	99%	-
Silicon Dioxide	mg/l	0	0	na	-
Silver	mg/l	0.028	0.0025	91%	1/2 of Detection Limit Applied
Aluminum	mg/l	0.19	0.005	97%	1/2 of Detection Limit Applied
Arsenic	mg/l	0.44	0.005	99%	1/2 of Detection Limit Applied
Antimony	mg/l	0	0	na	-
Boron	mg/l	0.42	0.19	55%	-
Barium total	mg/l	0.062	0.0025	96%	1/2 of Detection Limit Applied
Barium Hardness as CaCO ₃	mg/l	0.045	0.002	96%	1/2 of Detection Limit Applied

<u>Beryllium</u>	mg/l	0.0025	0.0025	0%	1/2 of Detection Limit Applied
<u>Total Calcium</u>	mg/l	1180	2.4	100%	-
<u>Calcium Hardness as CaCO3</u>	mg/l	2940	6	100%	-
<u>Cadmium</u>	mg/l	0.0025	0.0025	0%	1/2 of Detection Limit Applied
<u>Cobalt</u>	mg/l	0.03	0.005	83%	1/2 of Detection Limit Applied
<u>Chromium as Cr</u>	mg/l	0.005	0.005	0%	1/2 of Detection Limit Applied
<u>Chromium as CrO4</u>	mg/l	0.01	0.01	0%	1/2 of Detection Limit Applied
<u>Copper</u>	mg/l	0.26	0.005	98%	1/2 of Detection Limit Applied
<u>Cyanide</u>	mg/l	0	0	na	-
<u>Iron</u>	mg/l	0.54	0.005	99%	1/2 of Detection Limit Applied
<u>Hardness total as CaCO3</u>	mg/l	7240	15	100%	-
<u>Potassium</u>	mg/l	58.5	0.6	99%	-
<u>Lithium</u>	mg/l	0.25	0.001	100%	1/2 of Detection Limit Applied
<u>Magnesium</u>	mg/l	1040	2.16	100%	-
<u>Magnesium Hardness as CaCO3</u>	mg/l	4300	8.89	100%	-
<u>Manganese</u>	mg/l	2.24	0.005	100%	-
<u>Molybdenum as Mo</u>	mg/l	1.17	0.005	100%	1/2 of Detection Limit Applied
<u>Molybdenum as MoO4</u>	mg/l	1.96	0.01	99%	1/2 of Detection Limit Applied
<u>Mercury</u>	mg/l	0	0	na	-
<u>Sodium</u>	mg/l	457	4.3	99%	-
<u>Nickel</u>	mg/l	0.261	0.0025	99%	1/2 of Detection Limit Applied
<u>Phosphorus as P</u>	mg/l	0.98	0.025	97%	1/2 of Detection Limit Applied
<u>Phosphorus as PO4</u>	mg/l	3	0.075	98%	1/2 of Detection Limit Applied
<u>Lead</u>	mg/l	0.02	0.005	75%	1/2 of Detection Limit Applied
<u>Sulfur as S</u>	mg/l	3310	8.7	100%	-
<u>Sulfur as SO4</u>	mg/l	9930	26	100%	-
<u>Antimony</u>	mg/l	0.2	0.01	95%	1/2 of Detection Limit Applied
<u>Selenium</u>	mg/l	0.01	0.01	0%	1/2 of Detection Limit Applied
<u>Silicon</u>	mg/l	24	0.19	99%	-
<u>Silica</u>	mg/l	51.4	0.41	99%	-
<u>Tin</u>	mg/l	0.01	0.005	50%	1/2 of Detection Limit Applied
<u>Strontium as Sr</u>	mg/l	0.91	0.005	99%	1/2 of Detection Limit Applied
<u>Strontium Hardness</u>	mg/l	1.04	0.005	100%	1/2 of Detection Limit Applied
<u>Titanium</u>	mg/l	0.0025	0.0025	0%	1/2 of Detection Limit Applied
<u>Thallium</u>	mg/l	0.005	0.005	0%	1/2 of Detection Limit Applied
<u>Vanadium</u>	mg/l	0.014	0.0025	82%	1/2 of Detection Limit Applied
<u>Zinc</u>	mg/l	0.154	0.0025	98%	1/2 of Detection Limit Applied
<u>Zirconium</u>	mg/l	0.0025	0.0025	0%	1/2 of Detection Limit Applied
<u>TSS</u>	mg/l	82	5	94%	1/2 of Detection Limit Applied
<u>TDS</u>	mg/l	0	0	na	-

Table 10-8: Results from Applying Suez % Removal Example to Greens Creek Tailings Sample

Suez Example					
Parameter	Units	Influent	% Removal	Effluent Quality	Pickett Samples
pH	-	7.60	NC	7.60	0
Temperature	Deg C	14.80	NC	14.80	0
Alkalinity "P" as CaCO ₃	mg/l	0.00	NC	0.00	0
Alkalinity "M" as CaCO ₃	mg/l	110.00	82%	20.34	23000
Chloride as CL	mg/l	10.20	98%	0.18	0.64
Fluoride as F	mg/l	0.30	94%	0.02	0.16
Nitrate as NO ₂	mg/l	3.43	90%	0.34	Not Measured
Dissolved Organic Carbon C	mg/l	2.00	85%	0.29	Not Measured
Total Organic Carbon C	mg/l	0.00	86%	0.00	5300
Turbidity NTU	NTU	0.00	98%	0.00	0
Nitrite as NO ₂	mg/l	0.00	NC	0.00	0
Phosphate as PO ₄	mg/l	0.00	90%	0.00	0
True Color (Color Units)	Color Units	0.00	50%	0.00	0
Specific conductance at 25 deg C	umhos	2730.00	99%	17.40	Not Measured
Silicon Dioxide	mg/l	2.82	NC	2.82	Not Measured
Silver	mg/l	0.00	91%	0.00	0
Aluminum	mg/l	0.39	97%	0.01	0.04
Arsenic	mg/l	0.01	99%	0.00	0.011
Antimony	mg/l	0.03	NC	0.03	0
Boron	mg/l	0.10	55%	0.05	Not Measured
Barium total	mg/l	0.02	96%	0.00	0.059
Barium Hardness as CaCO ₃	mg/l	0.00	96%	0.00	Not Measured
Beryllium	mg/l	0.00	NC	0.00	0
Total Calcium	mg/l	427.00	100%	0.87	25
Calcium Hardness as CaCO ₃	mg/l	0.00	100%	0.00	Not Measured
Cadmium	mg/l	0.04	NC	0.04	0.0005
Cobalt	mg/l	0.00	83%	0.00	Not Measured
Chromium as Cr	mg/l	0.00	NC	0.00	0
Chromium as CrO ₄	mg/l	0.00	NC	0.00	Not Measured
Copper	mg/l	0.01	98%	0.00	0
Cyanide	mg/l	0.00	NC	0.00	0
Iron	mg/l	0.10	99%	0.00	1.6
Hardness total as CaCO ₃	mg/l	1830.00	100%	3.79	Not Measured
Potassium	mg/l	10.50	99%	0.11	0.4
Lithium	mg/l	0.00	100%	0.00	Not Measured
Magnesium	mg/l	185.00	100%	0.38	3.4
Magnesium Hardness as CaCO ₃	mg/l	0.00	100%	0.00	0

<u>Manganese</u>	<u>mg/l</u>	<u>3.18</u>	<u>100%</u>	<u>0.01</u>	<u>0.38</u>
<u>Molybdenum as Mo</u>	<u>mg/l</u>	<u>0.01</u>	<u>100%</u>	<u>0.00</u>	<u>0</u>
<u>Molybdenum as MoO4</u>	<u>mg/l</u>	<u>0.00</u>	<u>99%</u>	<u>0.00</u>	<u>0</u>
<u>Mercury</u>	<u>mg/l</u>	<u>0.00</u>	<u>NC</u>	<u>0.00</u>	<u>0</u>
<u>Sodium</u>	<u>mg/l</u>	<u>11.20</u>	<u>99%</u>	<u>0.11</u>	<u>3.7</u>
<u>Nickel</u>	<u>mg/l</u>	<u>0.32</u>	<u>99%</u>	<u>0.00</u>	<u>0</u>
<u>Phosphorus as P</u>	<u>mg/l</u>	<u>0.19</u>	<u>97%</u>	<u>0.00</u>	<u>20</u>
<u>Phosphorus as PO4</u>	<u>mg/l</u>	<u>0.05</u>	<u>98%</u>	<u>0.00</u>	<u>0</u>
<u>Lead</u>	<u>mg/l</u>	<u>0.35</u>	<u>75%</u>	<u>0.09</u>	<u>0</u>
<u>Sulfur as S</u>	<u>mg/l</u>	<u>0.00</u>	<u>100%</u>	<u>0.00</u>	<u>0</u>
<u>Sulfur as SO4</u>	<u>mg/l</u>	<u>1800.00</u>	<u>100%</u>	<u>4.71</u>	<u>21</u>
<u>Antimony</u>	<u>mg/l</u>	<u>0.00</u>	<u>95%</u>	<u>0.00</u>	<u>0</u>
<u>Selenium</u>	<u>mg/l</u>	<u>0.03</u>	<u>NC</u>	<u>0.03</u>	<u>0</u>
<u>Silicon</u>	<u>mg/l</u>	<u>0.00</u>	<u>99%</u>	<u>0.00</u>	<u>0</u>
<u>Silica</u>	<u>mg/l</u>	<u>0.00</u>	<u>99%</u>	<u>0.00</u>	<u>0</u>
<u>Tin</u>	<u>mg/l</u>	<u>0.00</u>	<u>50%</u>	<u>0.00</u>	<u>0</u>
<u>Strontium as Sr</u>	<u>mg/l</u>	<u>0.00</u>	<u>99%</u>	<u>0.00</u>	<u>0</u>
<u>Strontium Hardness</u>	<u>mg/l</u>	<u>0.00</u>	<u>100%</u>	<u>0.00</u>	<u>0</u>
<u>Titanium</u>	<u>mg/l</u>	<u>0.00</u>	<u>NC</u>	<u>0.00</u>	<u>0</u>
<u>Thallium</u>	<u>mg/l</u>	<u>0.00</u>	<u>NC</u>	<u>0.00</u>	<u>0</u>
<u>Vanadium</u>	<u>mg/l</u>	<u>0.00</u>	<u>82%</u>	<u>0.00</u>	<u>0</u>
<u>Zinc</u>	<u>mg/l</u>	<u>16.40</u>	<u>98%</u>	<u>0.27</u>	<u>0.24</u>
<u>Zirconium</u>	<u>mg/l</u>	<u>0.00</u>	<u>NC</u>	<u>0.00</u>	<u>0</u>
<u>TSS</u>	<u>mg/l</u>	<u>67.00</u>	<u>94%</u>	<u>4.09</u>	<u>Not Measured</u>
<u>TDS</u>	<u>mg/l</u>	<u>2600.00</u>	<u>na</u>	<u>2600.00</u>	<u>Not Measured</u>

Note in general found to be shallow and muddy with that antimony, cadmium, lead, selenium, all had input values below detection limit in the Suez example and therefore a NC input for those analytes is recorded resulting in false results for the tailings example. In addition, zinc shows a treated quality result of 0.03 ppm above the target water quality for discharge. **Figure 10-7** indicates that with the addition of MetClear reagent before the UF and RO systems, will increase the effective removal efficiency for zinc to be within the range of ambient groundwater concentrations prior the Ultrafiltration and Reverse Osmosis steps of treatment. This indicates treatment of zinc and other metals to below expected indicated ambient levels in groundwater is an achievable treatment goal.

To help reinforce and build confidence in the ability of modern water treatment, a series of additional examples were selected from different mining project sites throughout North America and are shown in the following **Table 10-9**.

Table 10-9: Additional Mining Company Water Treatment Examples

<u>Plant Location and Mine Type</u>	<u>Northern Quebec Ni Mine (open pit and underground)</u>		<u>EPA Superfund site in Breckenridge, CO, USA</u>		<u>Northern BC Mine, Underground Zn, Cu, Pb Mine</u>		<u>Central BC Cu/Au Underground Mine</u>	
<u>Treatment type</u>	<u>Sulphide</u>		<u>Sulphide</u>		<u>Sulphide / NaOH</u>		<u>Sulphide</u>	
<u>Operating Since</u>	<u>2003</u>		<u>2008</u>		<u>2015</u>		<u>2020</u>	
<u>Solid-liquid separation</u>	<u>Clarifier & Multimedia filtration</u>		<u>Clarifier & Multimedia filtration</u>		<u>Multimedia filtration</u>		<u>Clarifier & Multimedia filtration</u>	
-	<u>Feed</u>		<u>Effluent</u>		<u>Feed</u>		<u>Effluent</u>	
-	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>	<u>Feed</u>	<u>Effluent</u>	<u>Feed</u>	<u>Effluent</u>
<u>Ag</u>	<u>0.0005</u>	<u>0.0005</u>	<u>0.02</u>	<u>0.02</u>	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>
<u>Al</u>	<u>0.06</u>	<u>0.1</u>	<u>0.2</u>	<u>0.2</u>	<u><0.001</u>	<u><0.001</u>	<u>0.00002</u>	<u>0.00002</u>
<u>As</u>	-	-	<u>0.2</u>	<u>0.2</u>	-	-	<u>0.0325</u>	<u>0.0088</u>
<u>Ba</u>	<u>0.02</u>	<u>0.02</u>	<u>0.01</u>	<u>0.01</u>	<u><0.005</u>	<u><0.005</u>	<u>0.00063</u>	<u>0.0001</u>
<u>Ca</u>	<u>109</u>	<u>105</u>	<u>419.9</u>	<u>410.5</u>	-	-	<u>0.0972</u>	<u>0.0048</u>
<u>Cd</u>	<u>0.0016</u>	<u>0.0005</u>	<u><0.01</u>	<u><0.01</u>	-	-	<u>50.1</u>	<u>1.72</u>
<u>Co</u>	<u>0.106</u>	<u>0.002</u>	<u>0.04</u>	<u>0.01</u>	<u>0.0012</u>	<u><0.0005</u>	<u>0.000025</u>	<u>0.00002</u>
<u>Cr</u>	<u>0.001</u>	<u>0.001</u>	<u>0.01</u>	<u>0.01</u>	<u><0.005</u>	<u><0.005</u>	<u>0.0005</u>	<u>0.0005</u>
<u>Cu</u>	<u>0.128</u>	<u>0.001</u>	<u>0.01</u>	<u>0.01</u>	-	-	<u>0.001</u>	<u>0.001</u>
<u>Fe</u>	<u>0.08</u>	<u>0.05</u>	<u>123</u>	<u>106</u>	<u><0.005</u>	<u><0.005</u>	<u>0.0439</u>	<u>0.00239</u>
<u>Hg</u>	-	-	<u>0.00146</u>	<u>0.00091</u>	-	-	<u>0.0477</u>	<u>0.005</u>
<u>K</u>	<u>2.6</u>	<u>2.6</u>	<u>4</u>	<u>3</u>	<u>0.00035</u>	<u>0.00027</u>	<u>0.00001</u>	<u>0.00001</u>
<u>Mg</u>	<u>21.5</u>	<u>22.2</u>	<u>129.4</u>	<u>127.4</u>	-	-	<u>3.65</u>	<u>1.31</u>
<u>Mn</u>	<u>0.568</u>	<u>0.349</u>	<u>52.45</u>	<u>49.2</u>	-	-	<u>15</u>	<u>0.501</u>
<u>Mo</u>	<u>0.001</u>	<u>0.001</u>	<u>0.02</u>	<u>0.02</u>	-	-	<u>0.105</u>	<u>0.0035</u>
<u>Na</u>	<u>13.3</u>	<u>96.9</u>	<u>34</u>	<u>283</u>	-	-	<u>0.0136</u>	<u>0.001</u>

<u>Ni</u>	<u>6.85</u>	<u>0.156</u>	<u>0.19</u>	<u>0.11</u>	-	-	<u>15</u>	<u>20.2</u>
<u>Pb</u>	<u>0.001</u>	<u>0.001</u>	<u>0.3</u>	<u>0.05</u>	-	-	<u>0.001</u>	<u>0.001</u>
<u>Sb</u>	<u>0.001</u>	<u>0.001</u>	<u>0.1</u>	<u>0.1</u>	<u><0.005</u>	<u><0.005</u>	<u>0.0002</u>	<u>0.0002</u>
<u>Se</u>	-	-	-	-	-	-	<u>0.00056</u>	<u>0.0005</u>
<u>Zn</u>	<u>0.298</u>	<u>0.007</u>	<u>167.4</u>	<u>0.01</u>	<u><0.001</u>	<u><0.001</u>	<u>0.00466</u>	<u>0.00014</u>

For analysis, a feed or influent range was compiled as well as an effluent range considering each of these sites. The lowest end of the effluent range indicates obtainable treatment concentrations, though depending on the regulatory requirements at each site the highest range of the effluent quality may reflect what was permissible at a given site and should not be interpreted as a treatment limitation. The following **Table 10-10** shows this compilation as well as that range relative to the Pickett Mountain ambient groundwater quality data which is a surrogate for a treatment target until such time as background is statistically determined. This treatment target includes the highest detected concentration in the 2018 groundwater data set for detected analytes, or the method detection limit for those analytes not detected in groundwater. NA signifies the analyte (Cobalt) was not analyzed at Pickett Mountain in 2018. It is clear from the combination of samples that the Pickett Mountain effluent quality treatment target is within range of these water treatment capabilities. Given the specific and direct focus on Pickett Mountain from a water treatment supplier and operator, a high level of confidence exists for the ability to treat water to attain ambient groundwater quality at Pickett Mountain.

Table 10-10: Water Treatment Examples Compilation vs. Pickett Mountain Target

	<u>Feed Range from BQE Example Sites</u>	<u>Effluent Range from BQE Example Sites</u>	<u>Assumed Pickett Treatment Target**</u>
	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>
<u>Ag</u>	<u>0.00002 - 0.02</u>	<u>0.00002 - 0.02</u>	<u>MDL: 0.0003</u>
<u>Al</u>	<u>0.0325 - 0.2</u>	<u>0.0088 - 0.2</u>	<u>0.04</u>
<u>As</u>	<u>0.00063 - 0.2</u>	<u>0.0001 - 0.2</u>	<u>0.01</u>
<u>Ba</u>	<u>0.01 - 0.0972</u>	<u>0.0048 - 0.027</u>	<u>0.059</u>
<u>Ca</u>	<u>50.1 - 419.9</u>	<u>1.72 - 606</u>	<u>25</u>
<u>Cd</u>	<u>0.000025 - 0.01</u>	<u>0.00002 - 0.01</u>	<u>0.0005</u>
<u>Co</u>	<u>0.0005 - 0.106</u>	<u>0.0005 - 0.01</u>	<u>NA</u>
<u>Cr</u>	<u>0.001 - 0.01</u>	<u>0.001 - 0.01</u>	<u>0.002</u>
<u>Cu</u>	<u>0.01 - 0.128</u>	<u>0.001 - 0.01</u>	<u>.001</u>
<u>Fe</u>	<u>0.0477 - 123</u>	<u>0.005 - 106</u>	<u>1.6</u>
<u>Hg</u>	<u>0.00001 - 0.00146</u>	<u>0.00001 - 0.00091</u>	<u>0.0002</u>
<u>K</u>	<u>2.6 - 4</u>	<u>1.31 - 30.3</u>	<u>0.4</u>
<u>Mg</u>	<u>15 - 129.4</u>	<u>0.501 - 127.4</u>	<u>3.4</u>
<u>Mn</u>	<u>0.105 - 52.45</u>	<u>0.0035 - 49.2</u>	<u>0.38</u>
<u>Mo</u>	<u>0.001 - 0.02</u>	<u>0.001 - 0.02</u>	<u>0.005</u>
<u>Na</u>	<u>13.3 - 34</u>	<u>20.2 - 283</u>	<u>3.7</u>

<u>Ni</u>	<u>0.001 - 6.85</u>	<u>0.001 - 0.156</u>	<u>0.005</u>
<u>Pb</u>	<u>0.0002 - 0.3</u>	<u>0.0002 - 0.05</u>	<u>0.001</u>
<u>Sb</u>	<u>0.00056 - 0.1</u>	<u>0.0003 - 0.1</u>	<u>0.002</u>
<u>Se</u>	<u>0.00466</u>	<u>0.00014</u>	<u>0.002</u>
<u>Zn</u>	<u>0.005 - 167.4</u>	<u>0.007 - 0.017</u>	<u>0.24</u>

10.4.11.8 Conclusion

Although the examples above from several other locations have variable results based on the respective output qualities, the underlying technology with respect to water treatment is straight forward and will allow treatment of water at Pickett Mountain to indicated ambient water quality or better. Generally, mining companies have not needed to achieve such a stringent water quality output requirement and therefore examples of such a case have been difficult to source. However, between all of the examples provided, all analytes can be removed sufficiently to achieve discharge quality targets. In addition, the tables above indicate a conservative approach to water treatment relative to the proposed treatment plant for Pickett Mountain. The treatment modelling as well as the examples are all less robust treatment systems and do not include chemical treatment of the water before using the Ultrafiltration and Reverse Osmosis systems. In the case of the BQE examples, no reverse osmosis treatment is applied at all while still achieving output targets. During baseline studies, a tailings water sample will be collected during metallurgical testwork and will be submitted to pilot testing to multiple water treatment companies in order to confirm treatment abilities at Pickett Mountain.

Linkan Engineering, was contracted by SWCA Environmental Consultants to review components of the previously submitted Petition for Rezoning of Pickett Mountain as well as the related sections of the PEA. A summary opinion in a December 2/2020 memorandum from Linkan related to the water treatment is that "the documents that Linkan reviewed, indicate that Wolfden Mt. Chase LLC, has covered the main categorical issues that will be faced with the water treatment aspects of the mining project. Both water treatment during active mining and source control measures for closure will not be trivial especially with the no impact goals stated for discharge. We believe these issues can be mitigated and the goals met if good planning, testing/proving, engineering, and execution is done behind adequate funding and good management. Thus the water treatment aspects of the project appear feasible for the purpose of the rezoning".

Another memorandum submitted by Montgomery and Associates Water Resources Consultants and dated November 23/2020 summarized its findings and conclusions as follows:

1. "The water portion of the PEA appears to be completed to a professional standard and is based on reasonable and verifiable data as it exists to date.
2. The water management portions of the mining project appear to be viable and potential water quality or quantity impacts are acknowledged and planned to be studied.
3. The PEA meets the professional standard to justify the rezoning of the property for mining.
4. Two factors contribute to the confidence in water management at this site: 1) The need to maintain a strict water balance in order to maximize the use of water produced during the mining for service water, and 2) the recognition and dedication to build a water treatment facility."

10.4.12 Re-Infiltration of Treated Effluent

Several sources of information have been integrated to provide greater specificity on how treated stormwater will be collected, treated and managed (re-infiltration) for the proposed project. These include

Alternative 3 of the proposed Site Plan, Hydrocad modeling of pre and post development conditions including loadings associated with a 10-year 24-hour storm event and soil information from the Soil Suitability Evaluation (Wood E&IS and Atlantic Resource Company, 2020), and average precipitation data for Patten Maine. Combining these sources of information, which are reviewed below help inform a conceptual site model (CSM) of how treated stormwater can be effectively managed within existing site constraints without impacting the hydrology of wetlands.

Average Annual Precipitation Data

Table 10-11 below presents average precipitation data for Patten, Maine.

US Climate Data

Average Precipitation, Patten Maine

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
<u>Average Precipitation in Inches</u>											
<u>3.28</u>	<u>2.57</u>	<u>3.07</u>	<u>3.85</u>	<u>4.02</u>	<u>3.81</u>	<u>4.08</u>	<u>3.99</u>	<u>4.02</u>	<u>4.27</u>	<u>4.38</u>	<u>3.69</u>

[https://www.usclimatedata.com/climate/patten/maine/united-](https://www.usclimatedata.com/climate/patten/maine/united-states/usme0738)

Source: [states/usme0738](https://www.usclimatedata.com/climate/patten/maine/united-states/usme0738)

Typically, precipitation events are perceived to occur more frequently in the spring and late fall and with less intensity and frequency in the summer months, and presumptively the pattern of water collection, treatment and re-infiltration should be manipulated to mimic these natural patterns. Based on the data above in **Table 10-11** there is not a pronounced difference in precipitation in April and May compared to June and July or even August that are months commonly perceived to be much drier. From a shallow groundwater hydrologic perspective, probably a more important factor is temperature which drives the emergence of plants and leafing out of deciduous trees in latter May and June. This in turn drives evapotranspiration which may remove as much as 35 to 45% of precipitation from within root zone and shallow subsurface groundwater. It was noted in the wetland evaluation report that vernal pools dried up early in 2020 and this likely reflects removal of water from the shallow water table by evapotranspiration rather than a reduction in precipitation. The variability in wetland hydrologic conditions (water levels, surface water pools) may be greatly influenced by these factors at the site.

Water will be collected and treated and discharged in accordance with precipitation patterns. If more precipitation occurs in the spring, more water will be collected, treated and discharged in the spring than summer and more water will be treated and discharged in the late fall (October and November). The discharge locations (infiltration galleries) will be positioned upgradient of both wetland areas and upland areas so that wetland hydrology (replenishment of shallow or perched groundwater) can occur or be diverted if recharge needs to wetland areas have been satisfied. Details of wetland hydrology will be the subject of detailed studies implemented under the Chapter 200 baseline characterization program. That information as a well as pilot studies will be used to inform the detailed design of the treated effluent infiltration systems.

10.4.12.1 Storm Water Modeling

The modeling of the 10-year storm event provides additional loading that will need to be treated and re-infiltrated along with the normal flows associated with collection of normal annual precipitation from specific my operational areas. These flows would be blended with the average annual flow rate processed at a uniform rate. The annual precipitation for Patten Maine is approximately 45-inches/year. The additional

precipitation from a 10-year 24-hour storm event is an additional 3.4 inches which is equivalent to the average spring monthly precipitation (March /April). Spread over an entire year this represents an increase of 0.28 inches per month and is within average seasonal fluctuations.

The mine operation areas where storm water is collected and therefore excluded from modeled drainage areas includes a total 41.42 acres:

- 50% of the tailing's management Area open at any time
- lined ponds
- temporary non-mineralized rock storage pad
- concentrator feed storage and equipment pad
- low grade ore storage pad
- mine portal, and
- other intervening areas such as roadways.

50% of the total tailing's facility was selected due to the progressive closure of the tailing's facility. Since 10.1 acres (20%) of the tailing's facility will be operated at a time. As one cell (10.1 acres) is being operated, another unused cell is under construction. Cells that are under construction are not impacted and therefore water from that area is not collected. Once an active cell is filled or completed, it is closed and capped. Since there will be some overlap between closing and opening a new cell, it is assumed 50% of the area is required for collection of water at any given time. Capping the cell does not allow precipitation to come into contact with the tailings stored. Run-on and Run-off control structures on the cap will be designed to segregate waste contacted and non-waste contacted waters. Therefore, precipitation will not be impacted and will be allowed to discharge to the environment naturally instead of being collected and treated for re-infiltration to groundwater.

Storm water modeling for a 500-year storm event allows for the design of a larger pre-treatment pond which in combination with the other lined ponds can store all water from the mine operation areas that require collection for treatment. A 500-year storm is an extremely rare event (essentially a hurricane passing over central Maine), but in accordance with the Chapter 200 rules, the facility can and will be designed to handle such an event. Treatment and re-infiltration of that water will take some time, however, due to the storage capacity of the ponds (which can be augmented by storage capacity in the underground mine) such water can be processed through the treatment plant and re-infiltrated over a longer time frame. During mining, all groundwater seeps into the mine and does not flow out into the groundwater due to the negative pressure (inward gradient) caused by the underground openings. The mine is an effective backup for the water storage in any emergency situation like a 500-year storm events or others than can be imagined.

The additional treated water flows would be routed to infiltration galleries with excess hydraulic capacity at rates within those capacities. A 500-year storm is a 7.5-inch, 24-hour precipitation event and is equivalent to only approximately 17% or two months of the average annual precipitation and would not represent a long-term water management obstacle. This event is only approximately twice as large as the 10-year storm event which is included in the baseline plan for stormwater management. It is anticipated recovery from such a rare event could occur in three to four months of additional treatment and re-infiltration of excess water.

10.4.12.2 Soils Information

The Soils Suitability Evaluation Report provides information on depth of exploration, depth to restrictive layers and depth to bedrock were encountered in hand test pits. The mean depth of test pits was approximately 23 inches (range 4-60); the mean depth to restrictive layers was approximately 15 inches (range 8-29); and the mean depth to shallow bedrock where encountered was 19 inches (range 4-36).

Shallow water table conditions were encountered in 14 hand test pits, commonly a foot or more below ground surface. These observations are sufficient to inform the role and importance of the shallow perched water table condition in accepting precipitation as infiltration and supporting wetland hydrology where topography is conducive. In many cases test pits were dug near mapped wetland boundaries and shallow groundwater, as expected, was present. At other locations groundwater was not present, commonly where shallow bedrock was encountered. In New England it is well recognized that post glacial weathering has resulted in a shallow bedrock zone with enhanced transmissivity due to increased fracturing from glacial loading and unloading, and increased fracture apertures due to chemical weathering and frost action. In areas where bedrock is shallow, but a shallow water table is not present, it is presumed that the overlying soils in conjunction with bedrock are sufficiently transmissive to allow precipitation to rapidly infiltrate and recharge bedrock directly or migrate along the bedrock interface until fractures intercept that lateral water flow.

The Soils Suitability Evaluation Report and addenda also provide a basis to estimate vertical saturated hydraulic conductivity (KSAT) of soils by soil class. Represented as feet per day (ft/day) a histogram of the estimated KSAT values from all the test pits is provided below.

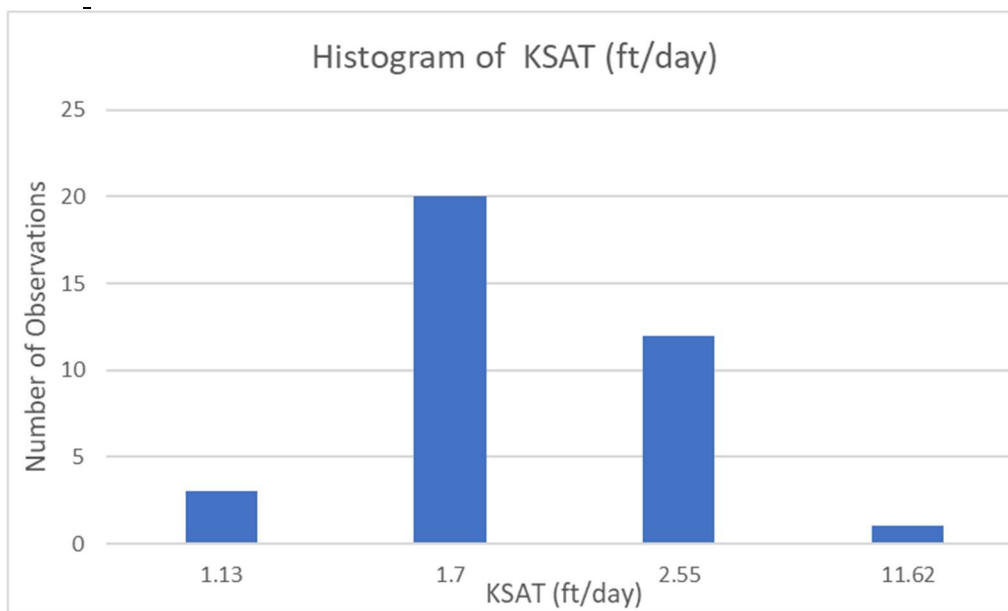


Figure 10-9: Histogram of KSAT (ft/day)

Since the low and high KSAT values of 1.13 and 11.62 are low frequency, they were disregarded in estimating average KSAT for soils observed on-site. The geometric mean of the remaining data is 1.98 ft/day.

10.4.12.3 Conceptual Site Model (CSM)

Based on current site-specific information, the CSM for the shallow groundwater system is bulleted below:

- Precipitation supports a spatially and temporarily variable overburden phreatic groundwater table wherein concavity of drainage topography concentrates shallow overburden groundwater movement to discharge locations expressed as forested wetlands and ephemeral and perennial stream systems.

- Overburden groundwater is not present across the Site, rather it occurs along the borders of the wetland systems in response to coalescing shallow bedrock groundwater flow that emerges topographically coeval with and supporting the shallow overburden groundwater system.
- Precipitation migrates vertically through unsaturated, well drained soils and asperities and openings within soil such as root casts, animal borrows, etc. and recharges shallow overburden groundwater and in absence of a phreatic water table, directly to bedrock
- The estimated vertical KSAT values cited above would be expected to be 10% of the horizontal hydraulic conductivities based on conventional hydrogeological practice. Horizontal saturated hydraulic conductivities are expected to be in the range of 19.8 feet/day.
- Topographic slopes south of the groundwater divide where most of the larger wetland systems are present are approximately 0.03 feet/foot. Assuming an effective porosity of 25%, this results in a seepage velocity for shallow groundwater movement in the range of 2.6 feet/day
- During rain events, surface water run-off will occur as unsaturated vertical drainage through unsaturated soil are exceeded by precipitation rates. As the soil becomes more saturated vertical hydraulic conductivities increase as water displaces air filled porosity in the unsaturated soil, until saturated hydraulic conditions are achieved.
- The monthly spring and summer precipitation rates are similar, an important control on wetland hydrology is temperature, plant growth and evapotranspiration.

Based on these observations and information, the objective is to re-infiltrate the treated clean water effluent at a rate consistent with the vertical and horizontal saturated hydraulic conductivity to minimize the potential of mounding. The mounding height is the height of saturated water table rise beneath the center of an infiltration gallery. The mound height is reduced by lateral transport away from the infiltration location. If the infiltration system is located above a flat-water table, lateral movement of subsurface water is only facilitated by the lateral gradient that exists at any time internally within the groundwater mound as it develops. In circumstances of a sloping water table, such as at the Pickett Mountain site, the lateral movement of groundwater will aid in dissipating and reducing the height of the groundwater mound.

The design objective is to have sufficient unsaturated thickness available above the water table such that mounding will not result in surface expression of that re-infiltrated water and adequate lateral movement of groundwater to help dissipate the groundwater mound.

As shown in the following analysis, these objectives can be met by site soil and hydrogeologic conditions and anticipated re-infiltration recharge rates. This will allow wetland hydrology to be unaffected by site development. This will be accomplished by re-infiltrating the amount of water removed upgradient in a drainage area (or sub-catchment area) where a wetland is present to the same drainage area hydraulically upgradient of the wetlands.

This is the essence of the information developed from the Hydrocad model for the Preliminary Site Plan.

10.4.12.4 Evaluation of Re-infiltration of Treated Effluent

The updated re-infiltration designs incorporate infiltration galleries IG's and replace the formerly proposed PDPs (potential disposal points). The IG's were developed ensure that no infiltration water reaches the surface and the influx of water to the wetlands remains unchanged.

- **Figure 10-10 (Preferred Alt 3)-Existing Conditions Watershed Map** depicting existing drainage conditions for the project site. DA-1 thru 8 on the northern portion of the site drain to Pleasant Lake and DA-9 thru 18 on the southern portion of the site drain to Pickett Mountain Pond

<u>Drainage Area (DA)</u>	<u>PRE (10-yr)</u>
<u>DA-1</u>	<u>20.26</u>
<u>DA-2</u>	<u>12.15</u>
<u>DA-3</u>	<u>16.23</u>
<u>DA-4</u>	<u>5.43</u>
<u>DA-5</u>	<u>18.38</u>
<u>DA-10</u>	<u>19.62</u>
<u>DA-11</u>	<u>65.55</u>
<u>DA-12</u>	<u>11.35</u>
<u>DA-13</u>	<u>19.58</u>
<u>DA-16</u>	<u>29.98</u>

- **Figure 10-11 (Preferred Alt 3)-Proposed Conditions Watershed Map** depicting proposed conditions based on preferred alternative 3 layout. DA-1 thru 8 (DA 6 thru 9 were unchanged and not included in table) draining to Pleasant Lake and DA-9 thru 18 (DA-14, 15, 17 and 18 were unchanged and not included in table) draining to Pickett Mountain Pond were modeled in HydroCAD (10-yr event) to determine amount of water being removed from each drainage basin as summarized in table below:

<u>Drainage Area (DA)</u>	<u>PRE (10-yr)</u>	<u>Post (10-yr)</u>	<u>Net Change (cfs)</u>
<u>DA-1</u>	<u>20.26</u>	<u>18.68</u>	<u>1.58</u>
<u>DA-2</u>	<u>12.15</u>	<u>10.79</u>	<u>1.36</u>
<u>DA-3</u>	<u>16.23</u>	<u>12.50</u>	<u>3.73</u>
<u>DA-4</u>	<u>5.43</u>	<u>4.70</u>	<u>0.73</u>
<u>DA-5</u>	<u>18.38</u>	<u>17.79</u>	<u>0.59</u>
<u>DA-10</u>	<u>19.62</u>	<u>19.20</u>	<u>0.42</u>
<u>DA-11</u>	<u>65.55</u>	<u>63.42</u>	<u>2.13</u>
<u>DA-12</u>	<u>11.35</u>	<u>9.33</u>	<u>2.02</u>
<u>DA-13</u>	<u>19.58</u>	<u>15.47</u>	<u>4.11</u>
<u>DA-16</u>	<u>29.98</u>	<u>24.84</u>	<u>5.14</u>

- DA-13.1, 16.1, 18 and 19 are portions of the mine facilities that required water collection areas for treatment. They were collected with proposed piping system and routed to the Pre-Treatment Water Storage Pond (Map ID 27). Water is then run through Water Treatment Plant and stored in Post Treatment Water Storage Pond (Map ID 35) and via a pumped system reinjected to the IG's 1 thru 8 (Map IDs 5, 9, 18, 19, 20, 21, 41 & 42) to infiltrate water from the areas removed as listed above and depicted below:

<u>Infiltration gallery (IG)</u>	<u>Map id</u>	<u>IG area (ac)</u>	<u>Removed from drainage area (da)</u>	<u>Area removed (ac)</u>	<u>Loading 10-yr storm (cfs)</u>
<u>IG-1</u>	<u>5</u>	<u>5.65</u>	<u>12 & 13</u>	<u>12.23</u>	<u>5.15</u>
<u>IG-2</u>	<u>9</u>	<u>2.13</u>	<u>2</u>	<u>4.64</u>	<u>1.36</u>
<u>IG-3</u>	<u>18</u>	<u>1.53</u>	<u>16</u>	<u>8.28</u>	<u>5.14</u>
<u>IG-4</u>	<u>19</u>	<u>2.05</u>	<u>10</u>	<u>0.68</u>	<u>0.42</u>
<u>IG-5</u>	<u>20</u>	<u>3.72</u>	<u>1</u>	<u>5.02</u>	<u>1.58</u>
<u>IG-6</u>	<u>21</u>	<u>3.83</u>	<u>3, 4 & 5</u>	<u>12.89</u>	<u>5.05</u>
<u>IG-7</u>	<u>41</u>	<u>3.89</u>	<u>11 & 12</u>	<u>5.13</u>	<u>3.13</u>
<u>IG-8</u>	<u>42</u>	<u>0.58</u>	<u>12</u>	<u>5.15</u>	<u>1.00</u>

To allow for a controlled release of cleaned water to the IG's and for emergency events, the Pre-Treatment Water Storage Pond (Map ID 27) has been sized to capture the areas removed from Pleasant Lake and Pickett Mountain Pond drainage (either side of the divide) and hold up to the 500-year storm event (219.81 cfs) while maintaining a 2-foot (Berm at 1215-1212.49, berm height minus peak elevation respectively) 2-foot freeboard. The Post Treatment Water Storage Pond (Map ID 35) has been sized to provide storage for up to the 10-year storm event.

The Hydrocad model was developed to appropriately control the re-infiltration of the captured water from the drainage areas and is delivered back to wetlands via the IG's so as to maintain the hydrologic needs of the wetlands. The Soils Suitability Evaluation Report provided the basis to model the receiving groundwater system (saturated thickness and KSAT values).

The analysis method for estimating the height of groundwater mounding used these inputs. The method used was the analytical solution developed by Hantush and described in the USGS publication USGS Scientific Investigation Report 2010-5102 "Simulation of Groundwater Mounding Beneath Hypothetical Stormwater Infiltration Basins." <https://pubs.usgs.gov/sir/2010/5102/>. The methodology was extensively peer reviewed and embraced by many state agencies including states in New England.

The analysis requires inputs concerning the geometry of the infiltration system, initial thickness of the underlying aquifer, duration of the infiltration, the recharge or infiltration rate, horizontal saturated hydraulic conductivity, and aquifer specific yield. Each of these parameters can be estimated based on the Hydrocad modeling and the Soils Suitability Evaluation Report, as well as published literature.

The IG's are envisioned as parallel linear trenches spaced perpendicular to groundwater flow as described in the Hydrocad model; with numbers, widths of granular backfill and lengths approximated in **Table 1** (attached). The Hydrocad model provides a means to apportion recharge removed from drainage areas to recharge applied to various IGs. The areas were computed for recharge of the total annual precipitation (45 inches) plus a 10-year storm event (3.4 inches) as the baseline case. Additional flows added to this include dewatering gains minus losses due to water contained in concentrates and tailings and pan evaporation in the large ponds (see **Table 10-12**). These data were used to compute recharge rates for each IG that were then apportioned to each trench system within that specific IG as a recharge rate. Horizontal hydraulic conductivity estimates from the Soils Suitability Evaluation Report were used (10X the vertical KSAT). These inputs were used to calculate mounding estimates above an assumed initial four-foot-thick water table for a specific yield of 0.25; equal to gravity drainage in soil porosity. A sensitivity analysis for a two-foot-thick

initial water table condition and a specific yield of 0.10 was also computed and noted in the table. The loading takes water collected from 41.2 acres and concentrates it by distributing it back to 23.4 acres of IGs (a ratio of 1.77). The loading as discussed also includes other sources of water (mine dewatering).

It should be noted that the Hantush analytical solution assumes a flat-water table, which is conservative compared to the sloping water table at the Pickett site which will further facilitate dissipation of the hypothetical groundwater mound. For the estimated recharge rates and system configurations the maximum mounding height from one year of recharge for IG-1 through IG-6 ranges from 0.31 to 0.62 feet and is well within the available unsaturated thickness of soils at that site including heights above water tables and restrictive layers. The worst performing IGs (IG-7 and IG-8) had predicted mound heights of 1.17 and 0.94 feet which are still acceptable based on available unsaturated thicknesses. These are not a limiting factor as these areas could be expanded or augmented if needed based on more site-specific data collection efforts. In addition, fill can be added to any of the galleries to increase the soil thickness and thereby reduced the risk of mounding. Such changes are anticipated and can be easily applied to subsequent designs that would result from the more detailed soil surveys of the baseline studies.

10.4.12.5 Conclusions

Based on this analysis the soils and hydrologic conditions described in the CSM, site conditions are acceptable for re-infiltration of treated effluent including dewatering flows, annual precipitation and a 10-year storm event without surface expression of these waters and with a distribution pattern that will continue to support the natural flux of water to the wetlands and therefore not impact surrounding streams, vernal pools and other surface water bodies. In the event of a 500-year storm, the proposed layout has sufficient pond storage to contain the additional water volume. The additional volume collected will be managed by gradually infiltrating into the system over a several month period utilizing IGs with excess hydraulic capacity or expanding the number of galleries.

10.4.12.6 Additional Considerations

The IG's will be designed in more detail based on field pilot studies. The details of the hydrologic system will be assessed further in the baseline hydrogeologic study required under the MDEP Chapter 200 rules. These studies will be necessary to properly design the controlled re-infiltration systems that support the continued values and function of the wetland systems. During operation the flows can be metered to individual IGs and the corresponding water tables in the wetland can be monitored manually or with transducers to verify correct re-infiltration rates and make adjustments on a real time basis. These systems can also be used to protect, improve or augment wetland systems including vernal pools when they are stressed by drought conditions that have persisted for the last year or more. Data available indicate these systems are feasible.

If additional hydraulic capacity is required, system expansion does not require extensive engineering or construction and is easily implemented. If additional disposal capacity for treated clean effluent is needed beyond the IG's proposed, these can be easily implemented, and cost-effective alternatives are also available that would have minimal impact on project profitability. These alternatives include spray irrigation which is permissible in Maine, and evaporation via commercial circulating flash evaporators and are both economically viable alternatives for excess water flows that (if) cannot be re-infiltrated.

The groundwater quality will be monitored during the life of the mine and for a period of time post-closure at intervals that is specified in the mining permit issued by the DEP. Monitoring will occur at locations where mining activities have a reasonable potential for impact to groundwater and surface water. In general, these parameters will be based on baseline indicated ambient water quality data and consideration of parameters

related to mining operations (metals, pH, specific conductance and inorganic parameters such as sulfate). Surface water and sediment quality will also be monitored under an approved program during mine operations and for a post-closure period specified in the mining permit. The DEP or a select department may require additional sampling of aquatic biological resources and monitoring of specific parameters at certain structures including water storage ponds, leachate collection systems and underdrains.

The overall water balance will be carefully managed to take advantage of recycling of all site contact waters including precipitation run-off and underground mine seepage water. These anticipated water sources will be further evaluated to determine the final design capacity of the water treatment system. These water sources will be treated and reused in the concentrator plant and therefore reduce part of the excess treated water requiring re-infiltration back to groundwater via the IG's.

A preliminary mine water balance has been developed. This preliminary estimate assumes all captured run-off water within the footprint of the developed facility will be collected and treated in addition to approximately 30 gpm of mine seepage water. The annual average precipitation over the facility footprint is equivalent to an average flow of 120 gpm. Water losses from the project include water lost to the mineral concentrates, water lost into tailings, pan evaporation and lost to treatment processes and sum to 52 gpm. This results in an average flow of approximately 98 gpm for reuse and or re-infiltration.

Therefore, the net re-infiltration of treated clean effluent back to ground, will be close to the natural recharge that is captured within the site footprint. Therefore, under these conditions, the operation would not require any additional sources of water supply (groundwater or surface water) and is envisioned to be sufficient and sustainable with respect to water requirements, use and management.

10.4.13 Potential Short- and Long-Term Socio-Economic Impacts

A socio-economic impact assessment was performed on the Pickett Mountain project in June 2021 by Stepwise Data Research based in Yarmouth, Maine.

10.4.13.1 Socio Economics Overview

Wolfden's proposed project lies in a relatively remote, rural area on the border of northern Penobscot County and southwestern Aroostook County, Maine. The closest community is Mount Chase, a settlement with about 200 residents, located a few miles south. A few miles farther south along Rt. 11 is the town of Patten, with about 800 residents. Patten has been designated a "rural hub" by the Land Use Planning Commission, the designation for a community that provides services to nearby communities. The nearest larger communities are Houlton (6,000 residents), a 40-mile drive to the east, and Millinocket (4,000 residents), 50 miles south. These larger communities are the region's principal employment centers and economic hubs and are classified as service centers by the State of Maine. The project is roughly equidistant to both communities and will have an economic impact on both, through workforce and business connections. Therefore, the Houlton and Millinocket LMAs, as defined by the U.S. Department of Labor, are the principal geography for analysis in the economic analysis. Because the proposed project's supply chain of businesses will extend beyond the labor market into each of the two counties, this analysis also presents statistics for Penobscot County, where Pickett Mountain and most of Millinocket LMA are located; Aroostook County, which contains most of Houlton LMA; and the state of Maine.

The following table provides an estimate of the economic impact of Wolfden's proposed project in terms of spending, output, earnings, and employment. In total, Wolfden expects to spend \$592 million dollars during fourteen years of planning and operations of the project (excluding contingency spending), of which \$312 million is expected to be spent with businesses located within the economic region of Aroostook and Penobscot Counties. As that spending ripples through the regional economy, a total impact of \$670 million

in output, \$234 million in earnings, and 4,240 job-years (roughly 303 jobs per year for 14 years) will be created within the regional economy. Including contingency spending, which is budgeted to be spent but not yet tied to specific budget items, the overall impact increases to \$698million in output, \$243 million in earnings, and 4,420 job-years. Although not directly comparable to industry employment, to contextualize the impact of 300 additional jobs in the region, note that 13 of 19 industries in Houlton LMA and 17 of 19 industries in Millinocket LMA had annual employment less than 300 in 2020. This is clarified in **Attachment B – Employment Context for Pickett Project Region**

Table 10-11: Socio Economic Outputs Excluding and Including Contingency Spending

<i>Impact Excluding Contingency Spending</i>			
Total Spending	Total Output	Total Earnings	Total Job-Years
\$591,647,100	\$669,725,900	\$233,737,900	4,240
Implied Multipliers	1.1	0.4	7.2
<i>Impact Including Contingency Spending</i>			
Total Spending	Total Output	Total Earnings	Total Job-Years
\$616,211,300	\$697,531,829	\$243,442,326	4,420
Implied Multipliers	1.1	0.4	7.2

Some additional qualitative assessments include the tourism industry, housing markets and training programs.

10.4.13.2 Tourism

The tourism industry is often conflated with the local demand from residents for recreation and entertainment. From an economic development perspective, a region's tourism industry represents the regional spending by visitors from outside of the region (preferably overnight visitors outside of the state). The Maine Office of Tourism researched the most popular attractions for overnight visitors in the Maine Highlands Region which includes Pickett Mountain. The following table lists those attractions and their approximate distance (by road) to the Pickett Project. With the exception of the Patten Lumberman's Museum, all of the most popular attractions are more than an hour drive from the project. None of the attractions are within the project's viewshed, and none are expected to be negatively affected by the project's operations, noise, or infrastructure. The project will not be able to be viewed from the most popular regional outdoor attractions: Moosehead Lake, Lily Bay State Park, Sebec Lake, Mt. Katahdin, Mt. Kineo, or Gulf Hagas. It is reasonable to assume that the Pickett Project will have no impact on visits to the region's primary tourism attractions.

Table 10-12: Maine Highlands Top Attractions for Overnight Visitors, 2019

35%	<u>Bangor Mall</u>	9%	<u>Moosehead Marine Museum (Greenville)</u>
29%	<u>Baxter State Park</u>	9%	<u>Mt. Katahdin</u>
21%	<u>Hollywood Casino (Bangor)</u>	7%	<u>Peaks Kenny State Park (Dover-Foxcroft)</u>
17%	<u>Moosehead Lake</u>	7%	<u>Mt. Kineo</u>
14%	<u>Maine Beer Trail</u>	6%	<u>Page Farm & Home Museum (Orono)</u>
13%	<u>Lily Bay State Park (Greenville)</u>	6%	<u>Patten Lumberman's Museum</u>
13%	<u>UMaine Museum of Art (Orono)</u>	5%	<u>Gulf Hagas</u>
13%	<u>Sebec Lake</u>	5%	<u>Maine Forest and Logging Museum (Bradley)</u>
12%	<u>Bangor Waterfront Concert Series</u>	5%	<u>Penobscot Theatre (Bangor)</u>
12%	<u>Dysart's Restaurant and Truck Stop (Bangor)</u>	5%	<u>Curran Homestead (Orrington)</u>

10%	<u>Maine Discovery Museum (Bangor)</u>	4%	<u>Katahdin Iron Works (Brownville)</u>
10%	<u>Collins Center for the Performing Arts (Orono)</u>	4%	<u>Wabanaki Art Center</u>
10%	<u>Cole Land Transportation Museum (Bangor)</u>	4%	<u>Thomas Hill Standpipe (Bangor)</u>

Snowmobiling and ATV riding are also important parts of tourism and local recreation in the Maine Highlands region. For snowmobilers, the Highlands region is the most visited tourism region with residents and the second most visited with non-residents; for ATV riders, it is the most visited. Both snowmobilers and ATV riders generally ride long distance: for example, resident snowmobilers drove an average of 780 miles in 2018-19; non-residents drove an average of 973 miles. There is no evidence that the Pickett Project would deter snowmobilers or ATV riders from visiting the region. No snowmobile or ATV trails are within the project's footprint, only one point is within its viewshed. Publicly available data on other forms of recreation like hiking, hunting, and fishing taking place within the Pickett region are sparse and it is unclear how large an economic market these forms of recreation make up and how many people from outside the region come to the Pickett region to recreate. While there are trails nearby (but none within the project boundaries), Pickett Mountain is not a world-class tourism attraction like Mount Katahdin, nor does it have "gateway-community" amenities close by. The project's footprint will be less than a square mile in a region of thousands of square miles of recreational opportunities. Based on a viewshed analysis conducted by Wood, the project will be visible at two potential viewpoints from ATV and hiking trails on Mount Chase. Wolfden does not intend to revoke access to its land for hunting or trail use (outside of the rezoned boundary which will be restricted for the safety of the public and its employees). All of these factors lead to the reasonable conclusion that the proposed project will have little to no negative effect on the regional tourism industry.

10.4.13.3 Housing Market

Home prices and rents in the Pickett region are affected by myriad factors that drive the overall supply and demand for housing in the region. Two primary drivers of demand, today, are a declining population and residents' relatively low incomes, both of which constrain demand for both new and/or higher-end housing options. A third demand driver – an aging population – is poised to impact preferences for the type and location of housing in the region as the housing needs for older residents change as they age. The supply of the region's housing is also complex, influenced in large part by its history as an industrial powerhouse. The region's housing stock is predominantly single-family homes, relatively older, and less expensive than in other regions. Today, all these factors interact in the form of house prices and rents that are lower than the statewide average and a housing vacancy rate that is above the state average, particularly in Houlton LMA (32%) and Millinocket LMA (42%). There are over 7,000 vacant housing units in the two labor market areas. Will the proposed mining project increase housing prices and rents? There are several reasons to conclude the proposed project will have little-to-no effect on housing prices and rents. First, the fundamental forces described above are long-term and deeply embedded into the market. It would be difficult for a project of finite length (14 years) to offset these long-standing trends. Second, Wolfden plans to hire 117 workers from the local economic region within about an hour from the site. While it is uncertain at this point in the planning process if Wolfden will be able to do so, its preference is to do so. Most of these workers will work "7-on, 7-off" schedules where they are on-site each day for a full week and then off work for the following week. As long as Wolfden is able to successfully hire from the local population of commuters, there will not be a substantial increase in demand for housing. To the extent that some workers will prefer to rent or buy a home closer to Pickett instead of commute, the extraordinarily high vacancy rate in the region will likely be able to absorb a modest impact on demand with little effect on overall pricing fundamentals. This assessment is dependent on Wolfden's ability to hire local workers once the mine is

operational. If Wolfden is unable to hire from the local region and instead imports 100 workers from outside of the region, the likelihood that this change in demand for housing pushes housing prices (likely rents) higher will increase.

10.4.13.4 Training Programs

In order to hire local workers with the requisite skills for the proposed project, Wolfden intends to develop a training program in conjunction with a local community college. While the details are not yet formed, it will likely resemble a similar training program that a Wolfden executive developed at New Brunswick Community College in Miramichi and Bathurst, New Brunswick, which trained 38 First Nations members for regional mining jobs. Wolfden expects the Maine-based training program to be 10 weeks in length for cohorts of 10-12 students and run several times per year. The direct impact of these trainings during the construction and operation phases of the project are embedded in the economic analysis detailed above. However, since these courses will teach mining skills that are transferable to other mining projects, the economic benefit would extend beyond the project's timeline as skilled workers find work and earn wages at other mines around the country. To fully quantify the economic impact of professional development for a portion of the region's workforce one would need to know the number of trainees expected to go through the program and their expected wages before and after training. However, one way to appreciate the potential impact is to note that the average wage in the Pickett economic region is roughly \$43,000, 38% less than the expected average wage of \$69,000 for onsite workers at the Pickett project. The list of employees required for project operations is identified in the table below:

Table 10-13: List of Employees

Workplace/Division	Employees/Day
Mine Production	16
Maintenance	22
Services	23
Development	16
Alimak Development	10
Supervision	4
Staff (G&A)	16
Mill Operations	12
Mill Staff	14
Total Employees Per Day	133

The list of employees describes the number of employees estimated per day. There are two operating shifts per day to cover the 24 hour per day operation. Therefore, 66 employees are anticipated on the site on average. The staff (G&A) employees are partially anticipated to be brought in from abroad. This is related to positions such as high level mine management where a significant amount of operating experience is required by the employee to ensure the health and safety of their direct reports as well as to ensure that the operation is able to run smoothly.

Table 10-14: G&A Employment Requirement

G&A	
<u>Position</u>	<u>Complement</u>
<u>Mine Manager</u>	<u>1</u>
<u>Mine Superintendent</u>	<u>1</u>
<u>Mill Superintendent</u>	<u>1</u>
<u>Technical Services Superintendent</u>	<u>1</u>
<u>Senior Engineer</u>	<u>1</u>
<u>Accountant</u>	<u>1</u>
<u>Eng/Geo technicians</u>	<u>2</u>
<u>Purchasing/Warehouse Manager</u>	<u>1</u>
<u>Environmental Coordinator</u>	<u>1</u>
<u>Medical Contract</u>	<u>1</u>
<u>Security Guard</u>	<u>4</u>
<u>Health and Safety Manager</u>	<u>1</u>
<u>Grand Total</u>	<u>16</u>

The complete socio-economic report can be found in **Exhibit 10 - Appendix B Economic Assessment of the Proposed Pickett Project.**

Wolfden Mt. Chase LLC

Exhibit 10: Attachment A - Figures

Exhibit 10 Figures Include:

Figure 10-1 Recreational Resources

Figure 10-2 Significant Sand and Gravel Aquifers

Figure 10-10 Watershed Existing Condiitons Layout 1

Figure 10-11 Watershed Proposed Conditions Layout 1

Wolfden Mt. Chase LLC

Exhibit 10: Attachment B - Reports

Exhibit 10 Supporting Documents Include:

Wood Environment & Infrastructure Solutions, Inc., Technical Memorandum – Noise Assessment Report

Attachment B – Prosolve Process Water Conditioning

Attachment B Pickett Mountain Environmental Reconnaissance Visit August 2018.

Suez Water Technologies and Solutions - Wolfden Cleaning Chemicals

Suez Water Technologies and Solutions - 428090-Wolfden Pickett Mtn Mine WWTP LTSA (Budgetary Letter)

Suez Water Technologies and Solutions - Wolfden Process Guarantee

Suez Water Technologies and Solutions - Safety Data Sheet METCLEAR* MR2435

Suez Water Technologies and Solutions – Halfmile Analytes

Stepwise Data Research - Economic Assessment of the Proposed Pickett Project

Attachment B – Employment Context for Pickett Project Region

Wolfden Mt. Chase LLC

**EXHIBIT 11 – REZONING TO/FROM PROTECTION
SUBDISTRICT**

11 REZONING TO/FROM PROTECTION SUBDISTRICT

Not applicable to this petition

Wolfden Mt. Chase LLC

EXHIBIT 12 – CORPORATE GOOD STANDING

12 CORPORATE GOOD STANDING

Not applicable to this petition

Wolfden Mt. Chase LLC

EXHIBIT 13 – FINANCIAL CAPACITY

13 FINANCIAL PRACTICABILITY

Funding for the Pickett Mountain project to date has been a combination of equity raises and timber sales from the property. Wolfden's market capitalization will be an important factor for its ability to fully finance the construction of the project. Although based metal prices have improved in 2021 and thereby the market capitalization of those companies that focus on base metal extraction, Wolfden, trades at a discount due to investor doubt about Wolfden being able to obtain a mining permit Maine. In addition, Wolfden is the first company in years to attempt to build a metallic mine in Maine and the first under the chapter 200 legislation and as a result, investors may be more cautious to invest in the project until the principle regulatory requirements (such as rezoning, baseline studies, feasibility studies, and a mining permit) have been successfully completed. Wolfden anticipates that this trend will continue for the project until milestones like the rezoning have been achieved and the project is proceeding well through its baseline studies.

Typically, mining projects are funded through a combination of project debt and equity whether the company is large or small. For small mining companies, the equity portion of the project financing is usually raised through several share issuances as the project completes the principal milestones as those listed above, such as the 1) Full Feasibility Study with a positive outcome; 2) Mine permitting approvals; 3) Approval of a project debt facility with a lead financial arranger; and 4) Positive results from any ongoing exploration that indicate the potential for additional resources.

Currently, Wolfden is actively exploring while in parallel pursuing a rezoning petition. Success on both of these fronts will significantly de-risk the project and thereby improve investor comfort in the project and in the future of metallic mining in Maine. Wolfden's two largest shareholders (Kinross and Altius) are larger mining companies with the financial capacity to finance the construction of the project. Similar to small investors, these larger investors could be interested in a partnership to develop the project or even a takeover of Wolfden so that they can develop the project themselves. There are other larger mining companies that continue to follow Wolfden's efforts and success in Maine who may also be interested in either approach as the project receives approvals on the milestones listed above.

The project financing will be based on a financial model included in the Preliminary Economic Assessment show in **Exhibit 13 - Attachment B** that will evolve further with more detailed drilling, baseline studies and feasibility work. The current financial model shows the project to be positive. Wolfden estimates that additional resources can be further defined at depth and within close proximity to the deposit that can further improve the financial returns and life of the project. The Company plans to continue with exploration and delineation drilling in parallel with all study work over the next two to three years. Wolfden completed the third party Preliminary Economic Assessment (PEA), which is typically completed before a Prefeasibility Study and Full Feasibility Study, as part of this petition. The PEA, with a financial accuracy of 50%, has been filed as an independently approved form of a public disclosure document required by those financial regulatory markets to which Wolfden reports. The PEA has included amongst other things, much of the similar technical information included in this rezoning petition, in addition to a more detailed (estimated) mine plan, schedule and estimated costs and revenues that support the positive economics and feasibility of building an operation at Pickett Mountain and in continuing with further exploration, technical studies and ultimately mine permitting. The economic results generated in the PEA are shown in the following tables.

Table 13-1: Preliminary Economic Assessment Cashflow Inputs

Undiluted Mineral Resources ~50/50 Indicate & Inferred	4,471,000 tonnes at grades of 9.51 % zinc, 1.23% copper, 3.77% lead, .88 g/t gold and 98.67 g/t silver	Average Mill Head Grade:	Payability	Average Long Term Pricing
Estimated Mining Dilution	10% at 0 grade			
Projected Mining Recovery	85%			
Zinc %		8.56	0.85	\$ 1.15
Copper %		1.11	0.95	\$ 3.00
Lead %		3.40	0.95	\$ 1.00
Gold g/t		88.80	0.95	\$ 1,500
Silver g/t		0.79	0.93	\$ 18.00
Pre Production Capital, incl Working Capital	\$ US 147.4 million			
Total Sustaining Capital	\$ US 100 million			
Financial Assurance Trust: Reclamation & Closure	\$ US 13.7 million			
Royalties	None			
Estimated Operating Costs (\$/Tonne)	\$ US 93.08 /tonne			
Life of Mine	9.7 years			

Table 13-2: Preliminary Economic Assessment Cashflow Outputs

	Pre-Tax	After Tax
Undiscounted Net Revenue	626.6 million	626.6 million
Undiscounted Total Cash Flow	462.5 million	390.8 million
NPV (5%)	305.2 million	255.5 million
NPV (8%)	238.1 million	198.3 million
IRR	40%	37%
Payback Period	2.4 Years	2.4 Years

With a high after-tax internal rate of return of 37% and a short payback period of 2.4 years, the economics of the study demonstrates that the project is very robust and will make a significant economic contribution to the state and communities. This type of robust return is what offers confidence to all stakeholders including the State of Maine, that regardless of the operator, such that Pickett Mountain is able to afford the most responsible planning and operating techniques to support the highest environmental standards and social security. Any risk related to market fluctuations is mitigated due to the high-grade nature of the deposit. For example, the PEA indicates that Pickett Mountain can continue to operate even if the price of zinc declines to as low as \$0.38 cents per lb.

Wolfden is committed to demonstrating to the mining community, its investors, and all relevant stakeholders that Maine is "open for business" when it comes to employing proven safe and modern mining and environmental management techniques. Rezoning, Mine Permitting and implementation of the project also would demonstrate that the LUPC and DEP rules governing metallic mineral mines are not preclusive of mining in the State of Maine. In addition, the designs of the project would result in one of the worlds "greenest" mining operations, receive one of the highest Environment, Social and Governance (ESG) rankings in mining and set a new higher standard for how a modern mine should be built and operated. This after all, must of the been in part, some justification in developing the chapter 200 legislation and something for which the State of Maine can take significant credit.

Wolfden benefits from established strategic relationships with larger companies such as Kinross and Altius, which supplements Wolfden's experience and financial capability in an effort to build a modern base metal mine in Maine. Wolfden's management has a significant track record of success in developing and building modern mining projects, including the financing of the largest producing mine in Burkina Faso, West Africa (Essakane Mine). The Essakane Mine is still the single largest contributor to the GDP of the country of over 18 million people, producing on average 390,000 oz of gold per annum and a daily mill processing rate of 36,000 tonnes per day. The capital required to build Essakane was over \$450 Million. Since all funding to build the Pickett Project must be in place up-front as part of the approval of a mining permit, Wolfden urges that the Commission not focus on its current balance sheet or market capitalization of today. The required project financing to build the project (or any other in the world) will not be pursued by any mining company, large or small, until the completion of all baseline studies, a full feasibility study and a successful mine permitting process.

Note that potential inconsistencies do occur between the PEA and the petition revisions due to continued data collection, studies, and designs that have been carried out on the project. None of these inconsistencies will result in significant variance to the economics of the project and therefore the financial and technical feasibility of the Pickett Mountain Project remains positive. In addition, it is worth noting that current based metal prices are much higher than those used in the PEA and if used as inputs in the same financial model, would result in a significantly more robust project and thereby much easier to finance and draw more interest from other mining companies looking to expand their production profile in North America.

Sensitivity analysis has been completed as part of the PEA and proves that even with significant variations in the model, the project cashflow is still comfortably positive. Yet again, building stakeholder confidence at all levels. Below, are two figures that identify the Net Present Value (NPV) with an 8% discount rate as well as the Internal Rate of Return (IRR) of the project given various fluctuations in model inputs by up to 20% variance. Even at -20% variance on any of the inputs, the NPV and IRR are both still positive at \$74 Million and 19% respectively. This is representation is of a worst-case scenario and still produces a robust positive output.

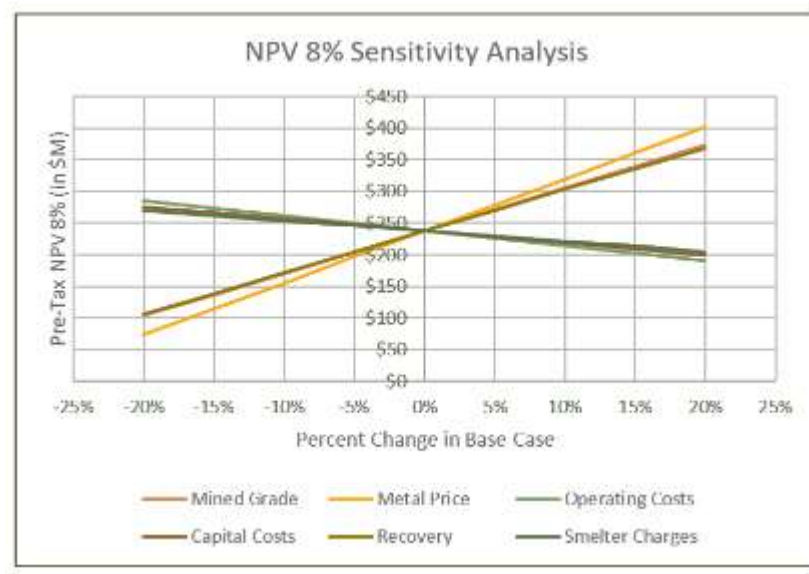


Figure 13-1: Sensitivity Analysis NPV(8%)

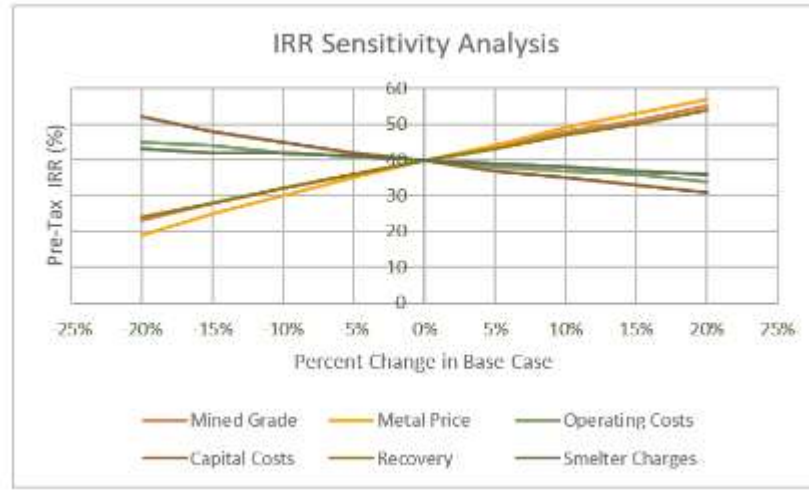


Figure 13-2: Sensitivity Analysis IRR

An independent review commissioned by the LUPC was completed by SWCA. The SWCA Environmental Consultants report dated January 29, 2021 titled "Third-Party Review of Technical Feasibility and Financial Practicability Assessment, Pickett Mountain Mine Project, Wolfden Mt. Chase LLC Rezoning Petition / SWCA Project No. 61402" summarizes that the description in the PEA are considered reasonable and, since the project would benefit from existing infrastructure (Roads, regional grid system) and key supply resources (water, electricity) in proximity to the project, any errors in the assumptions would not be expected to have material impact on the economic evaluation.

Wolfden Mt. Chase LLC

Exhibit 13: Attachment A - Figures

Exhibit 13 Figures Include:

Not Applicable

Wolfden Mt. Chase LLC

Exhibit 13: Attachment B - Reports

Exhibit 13 Supporting Documents Include:

A-Z Mining Professionals Limited – Preliminary Economic Assessment Pickett Mountain Project

Wolfden Mt. Chase LLC

EXHIBIT 14 – LOCATIONS REQUIREMENTS

14 LOCATION REQUIREMENTS

Not applicable to this petition

Wolfden Mt. Chase LLC

**EXHIBIT 15 – HARMONIOUS FIT AND NATURAL
CHARACTER**

15 HARMONIOUS FIT AND NATURAL CHARACTER

15.1 Introduction

Within one mile of the site, the area is forested and is currently in use for wood harvesting. In general, the area beyond one mile is surrounded by commercial forests. The site has been logged within the last 5 to 10 years and is in vegetative regrowth. Pickett Mountain Pond is within one mile of the site and Pleasant Lake (and nearby Mud Lake) are slightly beyond a mile. Maine Department of Inland Fisheries and Wildlife surveys (1958 and 1953 respectively) indicate both are shallow mud bottom ponds with warm temperatures at all depths in summer months lacking desirable. The ponds did not have conditions for supportive of cold-water fish species such as brook trout or salmon. The at the time of these surveys, but inlet and outlet streams however do provide habitat as (West Branch of the Mattawamkeag River, Pickett Mountain Stream and Spring Brook) provided spawning and nursery areas for trout nursing areas for trout and subsequent surveys have indicated the presence of cold-water springs, optimum dissolved oxygen level, excellent growth of brook trout in Pleasant Lake resulting in designation of the Lake as Heritage Trout Fishery by MDIFW. The use of these ponds and streams for recreational use is not restricted. There are six seasonal residences around Pleasant Lake; two are located within 675 feet of the southern shore, and four are located along the northern shore within 1,600 feet of the outlet to Mud Lake. These are depicted in **Exhibit 3**. Beyond the six seasonal residences depicted in **Exhibit 3**, there are no other residential or commercial enterprises or other established land uses proximal to the site. The Wolfden property is occasionally used for motorized recreation (ATVs and snow mobiles), and these uses foreseeably may continue outside the area of the future operations and any main access roads (although Wolfden reserves the right to assert its property interests against trespassers and assumes no liability for trespass on its property). Roads accessing private parcels within the Wolfden tract are established right of ways to these properties and their use will also continue.

Impact to recreational resources will be negligible with the only impact being related to two potential viewpoints. One from an ATV trail running along the north side of Mount Chase and another from a hiking trail to the summit of Mount Chase. Recreational resources are discussed at length in **Exhibit 15**.

There is a single public boat launch located on the south border of Pleasant Lake and a public boat launch on the northeastern shore of Lower Shin Pond, which is not located within 3 miles of the site. The site is not visible from either Lower or Upper Shin Pond. As discussed in Appendix A Section B(3)(d) water management and treatment will preclude water quality impacts to these lakes and ponds and associated streams. The proposed mining activities will in no way impact recreational use of these lakes or use of the surrounding area.

17. SUBDIVISION OR DEVELOPMENT ZONING PROPOSAL

The Wolfden Pickett Mountain proposal includes the needed above ground facilities to conduct underground mining of metallic minerals containing economic quantities of Zn, Cu, Pb Au and Ag. Preliminary planning of the facilities results in a compact clustering of above ground buildings and structures for office, warehousing, mineral processing and beneficiation (mill feed storage pad, crushing, milling, and flotation), capture of contact waters (precipitation and mine waters), water treatment and re-infiltration (PDP) galleries, and long term above ground management of tailings in conformance with Maine DEP regulations (dry stacked tailings facility). Underground facilities are accessed through a mine portal and are ventilated by above ground ventilation fans and shaft openings. The property location and project description, including phases of permitting, construction, operation and reclamation were presented in Sections 3 and 4. A description of anticipated site conditions, reclamation and beneficial use of the affected area are further described in Appendix A, Attachment Q. Appendix A section B(3)(d) discusses impacts on existing uses and natural resources and approaches used to avoid and minimize adverse impacts and address impacts if they were to occur. Section 18 and Exhibit N present project environmental reviews by the Maine Natural Areas Program for rare and exemplary botanical features and the Maine Department of Inland Fisheries and Wildlife for important fisheries, wildlife and critical habitat resources in the vicinity of the proposed project. Plant and animal habitat resources, recreational resources, and scenic resources are also discussed in Section 15.

The findings of these evaluations regarding harmonious fit, scenic impacts and wildlife habitat are discussed below.

The boat launch located on Pleasant Lake is an unmaintained and limited access located on the southeast boundary. The level of use of this boat launch is estimated at up to 10 uses per month with a maximum of 2-3 uses per day as a peak based on anecdotal evidence by the nearest camp tenant to the launch. Some additional impact to the use of the boat launch is anticipated due to increased traffic to the area by employees of the project during operation. Wolfden will work with the State to provide repair and maintenance services for the public boat launch based on increased use that may occur by site employees.

Each of these uses and their impacts are described in detail in **Exhibit 10.**

Harmonious Fit: -The project location is predicated by the location of the mineral deposit. -The siting of surface facilities (buildings, treatment plant, storage pads and dry stacked tailings) avoid ~~to the extent possible currently known areas of upland wetland, great ponds, streams~~wetlands and ~~limit visibility from surrounding areas.~~other surface waters. The area requested for rezoning incorporates a 400-foot buffer from proposed facilities. -The area is currently forested in regrowth from timber harvesting that occurred from 85 to 10 years ago. When developed a tree line will remain that will obscure the site facilities at ground level from most surrounding directions and areas. The area proposed for rezoning has a prominent ridgetop immediately west of the areas where proposed buildings would be constructed screening those buildings from view from that direction. A ring of higher elevation peaks is present south

of Picket Mountain Pond and north and west of Pleasant Lake. While an unobstructed line of site exists from Pickett Mountain Pond, Pleasant Lake, Mud Lake and Grass Pond, the visibility of the site itself would likely be obscured by tree lines that would be left in place around the developed areas. The most visible portion of the site would be the northern and northeastern corners of the dry stacked tailings area. There may be windows of visibility to this portion of the site along SR 11 north of the intersection with Route 212, but at large distances; approximately 8 miles distant. Visibility of ground elevation features such as buildings during operations and the tailings facility post-reclamation would be obscured by the tree line left in place.

~~When developed a tree line will remain that will obscure the site facilities at ground level from most surrounding directions and areas. The area proposed for rezoning has a prominent ridgetop immediately west of the areas where proposed buildings would be constructed screening those buildings from view from that direction. A ring of higher elevation peaks is present south of Picket Mountain Pond and north and west of Pleasant Lake. While an unobstructed line of site exists from Pickett Mountain Pond, Pleasant Lake, Mud Lake and Grass Pond, the visibility of the site itself would likely be obscured by tree lines that would be left in place around the developed areas. The most visible portion of the site would be the northern and northeastern corners of the dry stacked tailings area. There may be windows of visibility to this portion of the site along SR 11 north of the intersection with Route 212, but at large distances; approximately 8 miles distant. Visibility of ground elevation features such as buildings during operations and the tailings facility post-reclamation would be obscured by the tree line left in place.~~

The landforms surrounding the site are complex rolling hills and moderate elevation mountain peaks with mixed forests. The tailings management area will be graded to follow the ridgeline profile and upon restoration will be vegetated. Based on the topography, landforms and forested nature of the area, the proposed site is a reasonably harmonious fit with the surrounding environment and generally meets the CLUP's goal of protecting the high-value scenic resources of the surrounding area, ~~that would be more tolerant to visual impacts from the site. The tailings management area will be graded to follow the ridgeline profile and upon restoration will be vegetated. Based on the topography, landforms and forested nature of the area, the proposed site is a reasonably harmonious fit with the surrounding environment and generally meets the CLUP's goal of protecting the high-value scenic resources of the surrounding area.~~

An analysis of impacts to existing transportation routes, traffic circulation, and improvements is presented in Appendix A, Attachment J. **Exhibit 20** of this petition. The project as proposed will not require development of new roads and will improve existing gravel roads to improve traffic safety. -All roads off existing public roads are located on private land and currently used for logging operations and access to seasonal residences located on the southern and northern shore of Pleasant Lake.- The project will provide for parking of employees on-site. -The project will fit harmoniously into existing traffic patterns.

Signage for the project will be limited to traffic warning signs at the intersection of the private access road and SR 11 and will therefore not cause a visual impact and will aid in preventing a hazardous traffic condition.

All on-site above ground exterior lighting within the plant operations area greater than 60 watts or incandescent lights greater than 160 watts will be housed in downward facing full cut-off fixtures as specified in CLUP Standards under 10.25F. Signage for the project will be limited to traffic warning signs at the intersection of the private access road and SR 11 and will therefore not cause a visual impact and will aid in preventing a hazardous traffic condition.

~~All on-site above ground exterior lighting within the plant operations area greater than 60 watts or incandescent lights greater than 160 watts will be housed in downward facing full cut-off fixtures as specified in CLUP Standards under 10.25F. Other sources of light will include vehicle headlights and building interior lighting. Therefore, the project is making appropriate efforts to minimize light pollution and fit the project lighting needs harmoniously with the surrounding environment.~~

~~The project is located entirely on Wolfden owned land, is not adjacent to and will not affect existing communities or neighborhoods. Therefore, the project is making appropriate efforts to minimize light pollution and fit the project lighting needs harmoniously with the surrounding environment.~~

~~The project is located entirely on Wolfden owned land, is not adjacent to and will not affect existing communities or neighborhoods. Several seasonal residential properties are present along the shoreline of Pleasant Lake, but their view of the project will be obscured by the tree line left in place. Pleasant Lake lies entirely within the Wolfden owned parcel.~~

15.2 Scenic Impacts:

The project has provisions to minimize scenic impacts both during operating and post closure periods (after reclamation). The project would not be visible from primary recreational and scenic resources including the Katahdin Woods and Waters National Monument or nearby Upper and Lower Shin Ponds ~~as described in Section 19.~~ It is also worth noting that these recreational areas are located in a different watershed than the project.

During operations, the tree line surrounding the site will remain and obscure the site except for areas immediately south including Pickett Mountain and adjacent peaks. The site will also be visible from Pickett Pond. During operations the tailings facility will be graded and sequentially covered and closed in phases so that the profile will be maintained consistent with, though slightly higher than the existing ridgeline.

~~During operations, the tree line surrounding the site will remain and obscure the site except for areas immediately south including Pickett Mountain and adjacent peaks. The site will also be visible from Pickett Pond. During operations the tailings facility will be graded and sequentially covered and closed in phases so that the profile will be maintained consistent with, though slightly higher than the existing ridgeline.~~

During reclamation all buildings will be removed, and underground mine openings permanently closed. The water treatment plant will be decommissioned and removed last once it has been determined that it is no longer needed based on environmental monitoring. Therefore, at project closure no above ground structures will remain except the dry stacked tailings facility which will have been capped and revegetated. The site topography will be regraded and revegetated to mimic the original landforms, including the tailings facility whose profile will be below the surrounding tree line.

15.3 Scenic Resources

The project has been designed to limit impacts to scenic resources. The "below ground" mine operation limits the footprint of mine requiring a relatively small area for mine operations. The dry stacked tailings will cover approximately 50.5 acres and the total impacted area is 122.0 acres. This results in a total cleared area of approximately 158.6 acres. In addition, the dry stacked tailings will match base line contours, to not protrude from the surrounding topography. The overall elevation increase in the footprint of the dry stacked tailings is expected to be approximately 22 feet higher than ridgeline elevation with an engineered

maximum of 55 feet. Upon final closure of the mine operations the impacted areas that have not yet been restored, will be restored and allowed to reestablish as forest.

Once the mine operations end the impacted area will be restored and will be allowed to reestablish as forest, with possibly the exception of the final cap cover of the TMF which will be designed under the Chapter 200 detailed design. The topography surrounding the site provides the area proposed for rezoning a high degree of visual screening from public roads (Route 11 and Route 159) and the established high use recreation areas located to the west of the site. The area proposed for rezoning has a prominent ridgetop immediately west of the areas where proposed buildings would be constructed screening those buildings from view from that direction. A ring of higher elevation peaks is present south of Pickett Mountain Pond and north and west of Pleasant Lake. While an unobstructed line of site exists from Pickett Mountain Pond, Pleasant Lake, Mud Lake and Grass Pond, the visibility of the site would likely be obscured by tree lines that would be left in place around the developed areas. During operations the headframe would be the most visible portion of the site.

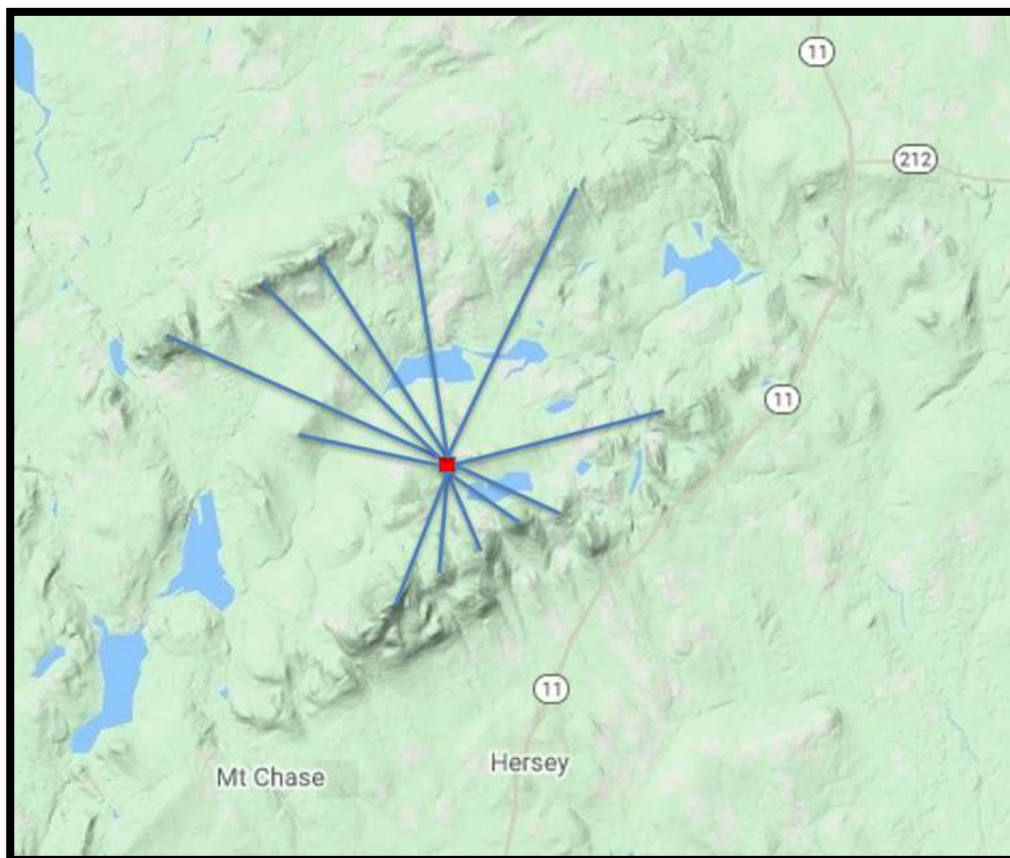


Figure 15-1: Peaks Surrounding Pickett Mountain Project Site

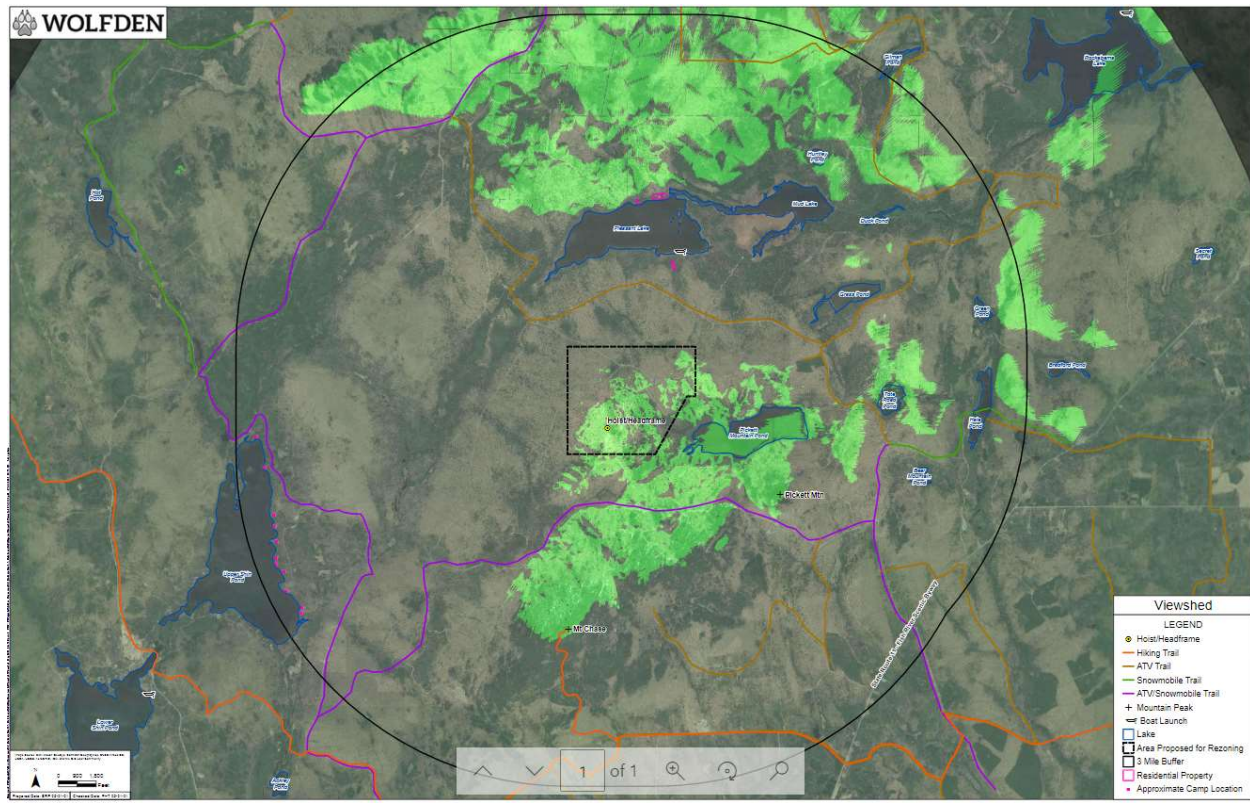


Figure 15-2: Three Mile Radius Analysis

The inner demarcation line encompasses the proposed site boundary. The outer circle is a 3.0-mile radius from the outer boundary of the site as proposed for rezoning. The analysis was conducted using a Google Earth Viewshed model (ground surface digital elevation model), which uses ground surface elevations to construct line of sight analysis. The view height is to the headframe which is 85 feet above ground level. Ground level elevation is established based on a LIDAR survey and references the elevations on the ground surface. The highlighted areas (and those highlighted on surrounding peaks) are potential areas with a line of site to the highest object on the property. This is a conservative analytical framework because it does not account for tree lines that both obscure portions of the target (the headframe) and viewing location. To obtain a line of site to the property from the surrounding areas, one has to be above the tree line to have an unobstructed view or have a view window through the trees. The property will not be visible from anywhere along Route 11 nor from any State park or State managed trail. There are no official trails within the proposed area, however, within a 3.0-mile radius of the site boundary, there are several ATV, snowmobile and hiking trails as shown in **Figure 15-2**. Hiking trails are along the south face of the mountain belt and a snowmobile/ATV trail travels along the north face of the mountain belt. Based on the sections below, trails that are travelled along the northeast face of Mount Chase are likely to have visual line of site to the property if standing on a cleared area. Similarly, if trees were cleared, seasonal residences located on the north borders of Pleasant Lake could potentially be in line of site of the top of the tailing's facility only. Wolfden intends to maintain a treeline surrounding site infrastructure to ensure scenic resources of these residences are not impacted. The headframe is 85 feet tall and would rise above the tree line approximately 55 feet and therefore would be the most visible point. Future additional site-specific studies (such as a weather balloon test to simulate communications towers) could be conducted to obtain a better understanding of actual visibility.



Figure 15-3: Viewshed Sections

15.4 Recreational Resources

The area in the immediate vicinity of the proposed rezoning is privately owned and has limited high value recreational resources (cold water fisheries, scenic views, primitive and remote locations). Public recreational use of the area is primarily motorized, accessing existing gravel logging roads including ATVs and snow mobiles. Wolfden will work with stakeholders to ensure continued trail connectedness and safe use of existing roads. The roads providing access to the site are already well developed and used extensively by logging operations. Recreational resources within 3 miles of the area proposed for rezoning are depicted and further described in **Figure 10-1**. No recreational trails exist within the proposed rezoning boundary.

Nearby designated recreational resources, including Lane Brook Pond, Green Mountain Pond as well as fish and wildlife protection subdistricts along portions of the headwaters to Upper Shin Pond, would not be affected directly by the project or indirectly through increased traffic or other causes. The tributaries to Upper Shin Pond are valued as stream spawning and nursery areas for brook trout and the thoroughfare to Lower Shin Pond for salmon. These areas are not within the watershed drainage of the proposed site. Upper and Lower Shin Pond are accessed by Route 159 which is not connected to any existing private or public roads used to access the site. The proposed site would not increase traffic to these areas. These recreational

resources are used by anglers in spring and summer months and by hikers and motorized recreational vehicles year-round. These recreational resources would also not be affected by the project.

The project would be visible from two potential viewpoints. One located at the summit of a Mount Chase hiking trail and one along a recreational vehicle route following the north face of Mount Chase. Both trails are identified on **Figure 10-1**. One of the parcels of the Katahdin Woods and Waters National Monument is located approximately 6.3 miles to the southwest just south of Lower Shin Pond and extends over to the Seboeis River approximately 9 miles from the site, and in a different watershed. This area is accessed by several unimproved roads off Route 159 that include scenic overlooks, picnic areas and an unimproved boat launch on the river. The proposed site would not increase use of these recreational resources. The site will not be visible from scenic viewpoints within the Monument.

The East Branch of the Penobscot River is located fifteen miles southwest of the site and is the eastern boundary of the largest parcel of the Katahdin Woods and Waters National Monument. Within the monument there are numerous recreational opportunities including hiking, fishing, camping, boating and biking; hunting and snowmobiling are permitted east of the East Branch of the Penobscot River. Mountain elevations in the Monument range from approximately 1,900 to 1,400 feet. The upland ridgeline where development is proposed at the site is approximately 1,200 feet in elevation and is surrounded by higher elevations to the northwest (Green Mountain - 1,600 feet and Lane Brook Hills-1,500 feet) and to the south (Picket Mountain- 1,700 feet), and to the southwest (Mount Chase -2,400 feet). Due to the surrounding elevations the site would not be readily visible from Upper or Lower Shin Pond, or vantage points from within the Katahdin Woods and Waters National Monument. The site would be within the line of sight from the summit of Sugarloaf Mountain, but at an extreme distance of 7.3 miles. Sugarloaf Mountain is located approximate 2 miles northwest of Lower Shin Pond and is not the same as the ski area located in Carrabassett Valley. The proposed mine site would not have visual or other adverse impacts on the scenic values of these recreational resources.

Development of the site would not increase traffic to these areas since they are accessed by roads not connected to the site.

The project will not impact recreational activities outside of the proposed rezoned boundary including access for traditional recreational activities, including ATV and snowmobile trail connectivity. If a concern is identified related to the health and safety of Wolfden's employees or the general public, then Wolfden will ensure that modifications to or relocation of connectors will be implemented to address that concern.

Wolfden Mt. Chase LLC

Exhibit 15: Attachment A - Figures

Exhibit 15 Figures Include:

Not applicable

Wolfden Mt. Chase LLC

Exhibit 15: Attachment B - Reports

Exhibit 15 Supporting Documents Include:

Not Applicable

Wolfden Mt. Chase LLC

EXHIBIT 16 – FIRE, POLICE, AND AMBULANCE

16 FIRE, POLICE, AND AMBULANCE

Public and Community Services

<u>Service / feature</u>	<u>Name of provider / facility</u>	<u>Distance (in miles) from site:</u>
<u>Ambulance</u>	<u>Island Falls Ambulance Service</u>	<u>23</u>
<u>Education</u>	<u>RSU 89, (Stacyville, ME)</u>	<u>30 / 18.5</u>
<u>Fire</u>	<u>Island Falls Volunteer Fire Department</u>	<u>23</u>
<u>Police</u>	<u>Penobscot County Sherriff Dept. (Bangor) / Aroostook County Sheriff</u>	<u>90 / 45</u>
<u>Solid waste disposal (during construction: construction debris, stumps, brush, asphalt and pavement products)</u>	<u>Casella Waste Management (Houlton ME)</u>	<u>44</u>
<u>Solid waste disposal (after construction)</u>	<u>Same</u>	
<u>Public water supply (if</u>	<u>NA</u>	
<u>Public wastewater (if</u>	<u>NA</u>	
<u>Public road</u>	<u>State Highway Route 11</u>	<u>4.5</u>
<u>Service center</u>	<u>Houlton, ME</u>	<u>39</u>
<u>Electric utilities</u>	<u>Emera Maine (New power transmission line from Patten)</u>	<u>14.6</u>
<u>Phone/Internet utilities</u>	<u>Viasat Highspeed – Clearconnect (Satellite)</u>	<u>NA</u>

Potential Impacts on Services

This section contains an evaluation of the potential impacts on services (including fire and police protection, education, and solid waste disposal) and utilities. The evaluation identifies the proximity or availability of those services and utilities, and potential burdens for communities or State, county or local governments to provide those services if burdened.

Evaluation of Sufficiency of Existing Services and Utilities, and General Measures to Increase Service Capacities (if required) including Burdens on Communities or Government to Provide Those Services. A detailed section on socio economics including impacts on labor markets, housing and training are included in **Exhibit 10** of this petition.

16.1 Public Safety Services

Services related to public safety include fire, 9-1-1 emergency response / ambulance and police services. Some of these services are provided by local towns while others are provided at the County Level.

The project site, when including private access roads, falls within both Penobscot and Aroostook counties. Each county has its own Regional Communication Center which acts as a dispatch Public Safety Answering Point (PSAP) operating on a 24-hour basis to answer and relay 9-1-1 calls, or directly dispatch emergency services. The Penobscot RCC, located in Bangor, supports residents in both Penobscot and Aroostook counties. The Aroostook RCC is located in Houlton and responds to all 9-1-1 calls originating in the county. The facility is housed collectively with Maine State Police Troop F, Maine Warden Service, Maine Forest Service and the Maine Fire Marshalls office. The Aroostook RCC handles dispatches for all state public safety

agencies including the Aroostook County Sheriff's Department, the County office of Emergency Management and local fire departments including Oakfield.

Locally, several of the towns closest to the site have volunteer fire departments including Patton, Island Falls, Sherman and Oakfield. Island Falls also has an enhanced 9-1-1 Ambulance service. Island Falls has indicated its ambulance and fire response capabilities is sufficient to conceptually support Wolfden's plan and potential need for services. A letter to this effect is in **Exhibit 16 - Attachment B Island Falls Fire and Ambulance Support Letter.**

Police services, primarily law enforcement, are provided through the Aroostook County Sheriff's Department in Houlton and the Penobscot County Sheriff's Department in Bangor. Law enforcement is also supported by the Maine State Police Troop F which is responsible for police coverage for all of Aroostook County and the northern parts of Penobscot, Piscataquis and Somerset Counties.

16.2 Burden on Public Safety Services

The proposed mine will be developed incorporating fire protection standards for building design and related structures. The mine will be operated under a very strict and well-defined safety program and in conformance with OSHA General Industry standards which also include requirements for medical, first aid and fire protection. Wolfden will provide for any fire response underground as this requires specialized training and equipment that will be provided in house. Employees are specifically selected from various crews working throughout the site in order to ensure emergency and fire response teams have in depth knowledge of the environments which they are attending to. Thorough emergency response training programs that are established within the mining industry and include areas of focus such as first responder, firefighting, fire rescue, amongst others. With the exception of volunteer fire, public safety services are implemented and funded at the county level. Wolfden's mining operations will provide a tax base that will contribute to the state and county services.

It is not expected that mine operations will place a significant burden on public safety services.

It is noted that in recognition of the decline in number of volunteer fire fighters in Maine, in 2017 the Maine Legislature passed a pension system for volunteers based on time of service (Maine Length of Service Award Program). The state of Maine does have a Volunteer Fire Assistance (VFA) Program for rural fire departments to provide federal financial and technical support in the form of matching fund grants that meet specific established criteria. Wolfden is sensitive to the volunteer nature of fire-fighting services within the communities near the proposed project.

16.3 Healthcare and Medical Service

The Houlton Regional Hospital is a major regional hospital that provides a full range of medical services. Other medical services are also available from private physicians practicing in the area.

The Katahdin Valley Health Center has two facilities in Patten. One covers primary and dental care and includes a pharmacy. The second center is primarily engaged in occupational physical therapy and chiropractic care.

16.4 Burden on Healthcare and Medical Services

There are abundant sources for medical services in the area. Health care and social services is the largest employment sector in the Houlton LMA. The proposed mine will not burden healthcare and medical services in the area.

16.5 Power and Utilities

Power and other utilities are addressed in **Exhibit 19** of this petition. The project will require the addition of its own powerline from Route 11 as well as back generators and will provide its own source of water, for drinking purposes and handle its own human sewage with the use of contract services (underground portable toilets) and on surface with a typical septic system. There will be no burdens to towns or municipalities for any of these services.

Wolfden Mt. Chase LLC

Exhibit 16: Attachment B - Reports

Exhibit 16 Supporting Documents Include:

Island Falls – Island Falls Fire and Ambulance Support Letter

Wolfden Mt. Chase LLC

EXHIBIT 17 – EDUCATIONAL SERVICES

17 EDUCATIONAL SERVICES

17.1 Education Services

Within the labor market area as described previously, the public educational needs of families are served through four regional school districts including RSU 29, RSU 50, RSU 70 and RSU 89 as shown below. The current total student body from elementary school through high school is approximately 2,563 based on information from the Maine Department of Education. RSU 89 was recently formed from communities previously within RSU 50.

Regional Public Schools Serving Local Towns and Communities

<u>School Year</u>	<u>SAU Name</u>	<u>School Name</u>	<u>Number of Students</u>
<u>2019</u>	<u>RSU 29/MSAD 29</u>	<u>Houlton Elementary School</u>	<u>423</u>
<u>2019</u>	<u>RSU 29/MSAD 29</u>	<u>Houlton High School</u>	<u>364</u>
<u>2019</u>	<u>RSU 29/MSAD 29</u>	<u>Houlton Junior High School</u>	<u>298</u>
<u>2019</u>	<u>RSU 29/MSAD 29</u>	<u>Houlton Southside School</u>	<u>319</u>
<u>2019</u>	<u>RSU 50</u>	<u>So Aroostook School</u>	<u>358</u>
<u>2019</u>	<u>RSU 70/MSAD 70</u>	<u>Hodgdon Middle/High School</u>	<u>191</u>
<u>2019</u>	<u>RSU 70/MSAD 70</u>	<u>Mill Pond School</u>	<u>284</u>
<u>2019</u>	<u>RSU 89</u>	<u>Katahdin Elementary School</u>	<u>145</u>
<u>2019</u>	<u>RSU 89</u>	<u>Katahdin Middle/High School</u>	<u>181</u>
<u>Total</u>	<u>=</u>	<u>=</u>	<u>2,563</u>

<u>RSU No.</u>	<u>Communities Served</u>
<u>RSU 29</u>	<u>Houlton, Hammond, Littleton, and Monticello</u>
<u>RSU 50</u>	<u>Crystal, Dyer Brook, Hersey, Island Falls, Merrill, Oakfield, and Smyrna</u>
<u>RSU 70</u>	<u>Amity, Cary Plantation, Haynesville, Hodgdon, Ludlow and New Limerick</u>
<u>RSU 89</u>	<u>Mount Chase, Patten, Sherman and Stacyville</u>

17.2 Burden on Education Services

It is anticipated the majority of the mine work force will be employed from Maine residents within the Penobscot and Aroostook Counties. Initially, some of the work force may be imported into the area. These imported workers would contribute to the local economy through spending and taxes. Therefore, there may be a small increase in student enrollment in some school districts. This increase however should be small and would not represent a disproportionate burden. Otherwise it is expected that current or future educational needs of existing residents who become employed by Woflfdn are already being met or anticipated and would not represent a burden on services. RSU 89, located closest to the site in Stacyville confirmed that the expected level of additional educational services is not a burden. A letter to this effect is in **Exhibit 17 - Attachment B RSU Letter of Support**.

Wolfden Mt. Chase LLC

Exhibit 17: Attachment B – Reports

Exhibit 17 Supporting Documents Include:

RSU 89 – Available Services from the Regional School Unit No. 89

Wolfden Mt. Chase LLC

EXHIBIT 18 – SOLID WASTE DISPOSAL

18 SOLID WASTE DISPOSAL

18.1 Construction and Site Preparation

Grubbed organic material will be managed on-site when possible. Most of the timber and stumps are small, and to the extent timber removed has limited or no economic value, it will be chipped on-site for use as erosion control materials, including stumpage. At an estimated 360 cubic yards of mulch generated per acre of stumps (average forest property) the total estimated biomass generation is 57,000 cubic yards. Any excess chipped or ground material will be made available to contractors for use as erosion control or biomass material. A letter to from Sargent Corporation is provided in **Exhibit 18 - Attachment B Consumption of Excess Chipped Material** as a confirmation of demand for excess material.

Unused materials during construction such as excess concrete are sent back to the supplier or transported to an approved landfill facility. Confirmation of waste management capacity is identified in **Exhibit 2 - Attachment B Pine Tree Waste Services Waste Removal Proposal**.

18.2 Operations

During operations at Pickett Mountain, solid waste material will generally be made up of cardboards and packaging from plastics along with paper refuse, however, paper from offices etc. will be recycled where possible. Chemicals and explosives are typically packaged in plastic bags or plastic packaging depending on the type and quantity. Liquid chemicals for water treatment and concentration are stored in reusable plastic and aluminum totes that can be washed and reused in majority of applications. Construction waste materials such as lumber and metal fasteners will be generated onsite but in limited fashion. Steel from damaged underground screen mesh and worn-out steel pipe make up majority of steel refuse. These materials are generally recovered and recycled and that will be the goal of the operation. Broken down motors, pumps, etc., will be repairs or recycled where possible. Typically, an operation this size will make use of 2-3 6 cubic yard rear load dumpsters that will be serviced on a weekly basis.

Solid waste management in the area is serviced by Casella Waste Management, including the Pine Tree Waste transfer station in Houlton and the Northern Katahdin Valley Waste Disposal District in Dyer Brook. This district serves the communities of Amity, Crystal, Dyer Brook, Hammond, Hersey, Island Falls, Merrill, Moro Plantation, Mount Chase, Patton and New Limerick. The facilities offer commercial and municipal waste disposal transfer. There would be no burden on these services as they are paid for services.

18.3 Closure/Reclamation

During closure and reclamation activities, majority of major component are disassembled and sold through the services of a demolition contract. Recyclable materials such as copper, steel, plastics, etc. are sorted and sold through the same contract. During demolition and removal of infrastructure component, demolition debris that is not considered for recycling or sale will be disposed of in an appropriate manner. Foundations will be broken up and tested. If subsequently approved by the MDEP, this material will be disposed of in the underground excavation prior to final closure of openings. If contamination is identified, then demolition debris will be transported to an approved waste management facility.

Wolfden Mt. Chase LLC

Exhibit 18: Attachment A - Figures

Exhibit 18 Figures Include:

Not Applicable

Wolfden Mt. Chase LLC

Exhibit 18: Attachment B - Reports

Exhibit 18 Supporting Documents Include:

Consumption of Excess Chipped Material

Wolfden Mt. Chase LLC

EXHIBIT 19 – ELECTRICITY AND COMMUNICATIONS

19 ELECTRICITY AND COMMUNICATIONS

19.1 Electrical Supply

Electricity is required for the project to operate electrical equipment including pumps, motors, and lighting in each area of the project. The estimated consumption for standard operation of Pickett Mountain is 4.8 megawatt (MW) with a peak consumption of 6.0 MW. The main site voltage will be 4160v and will be stepped down to motor requirements (440v – 1000v motors depending on final design).

The project will require a new transmission line to provide the needed energy requirements. The project will require emergency back-up power in the form of generators, but these would be used only when needed. Any new energy generation will be used exclusively for the project and will be focused to necessary functions such as fire water pumps, sump pumps, large power motors in order to shut them down safely, heat trace for winter operations, etc. The anticipated power generation requirement is roughly 1/3 of the total power demand. Solar power will also be considered as an alternative source of power and a sufficient area has been allowed for in the rezoned area to generate the total required capacity of 4.8 MW. If solar power is a successful alternative, a transmission line will still need to be installed to ensure operations continue to take place without interruption as well as to supply power for peak loading. The transmission line will be funded by Wolfden and operated by Versant Power (Previously Emera Maine). The transmission will be sourced from a supply station in Patten and travel North on route 11. The line will then follow the access road into the site via overhead line and ultimately terminate at the project site. Transmission line voltage is proposed at 44kV which will be stepped down to 4160v through and onsite power transformer.

All electrical components at and from this termination point will be funded, owned and operated by Wolfden. The receiving substation and switchgear components on site will be enclosed by fencing with a locking gate as well as appropriate signage posted for employee protection. Versant has confirmed that supply of this power requirement is feasible. A letter to this effect is included in **Exhibit 19 - Attachment B Emera Maine Power Supply.**

19.2 Communications

Communications for Pickett Mountain will be supplied by Clear Connect which will supply services from either Viasat or Hughesnet. Voice communications will be via voice over IP (VOIP) or through a boosted cellular service. A letter from the communications supplier confirming feasibility is shown in **Exhibit 19 - Attachment B – LT# 39004 Business Internet Options.**

Wolfden Mt. Chase LLC

Exhibit 19: Attachment A - Figures

Exhibit 19 Figures Include:

Not applicable.

Wolfden Mt. Chase LLC

Exhibit 19: Attachment B - Reports

Exhibit 19 Supporting Documents Include:

Versant Power (Emera Maine) – Power Supply Letter

ClearConnect - LT# 39004 Business Internet Options.

Wolfden Mt. Chase LLC

EXHIBIT 20 – PUBLIC ROADS

20 PUBLIC ROADS

This Exhibit provides a map and description of existing transportation infrastructure routes, and an analysis of potential impacts and improvements. Access to the site is through well developed and well-maintained private gravel roads, currently used for logging. These private roads connect to a series of State highway routes and eventually the interstate system. These routes will be used for travel of employees to work and for transportation of mineral concentrates to market for smelting. The additional traffic volume and capacity of this road system does not burden existing infrastructure and Wolfden will evaluate with MDOT and implement measures to ensure the continued safe use of all public roads.

20.1 Description of Proposed Transportation Infrastructure Routes, Impacts and Improvements

The following transportation evaluation describes the proposed route to be used by trucks carrying mineral concentrate from the proposed Pickett Mountain site to the US – Canadian border, the level of additional traffic, potential impacts and potential improvements to promote safety. The proposed route is dependent on the final locations where mineral concentrate will be shipped for further processing (smelting) in Canada. The processing locations have not been finalized and therefore the proposed route could be subject to change.

20.1.1 Transportation Need

The proposed mining activity has an anticipated mill feed rate of 1,200 tonnes/day with anticipated metal recoveries, total concentrate yields will be approximately 192 tonnes/day of concentrate for shipment (423,288 lbs.). Typical tractor trailer tare weights (empty weight including driver and fuel) vary and range from 26,000 to 37,000 lbs. Using an average of 32,000 lbs. tare weight allows 48,000 lbs. for cargo; requiring approximately 9 shipments per day.

Roads within the area will also be used for employee travel to and from the project site as well as all supply vehicles.

20.1.2 Route Description

The proposed truck route consists of gravel roads on private property from the Pickett Mountain site to public roads that include three rural state highways, and one US Interstate Highway (See **Figure 20-1**) for locations and sections). From the site, trucks will travel on private gravel roads to Maine (ME) State Route 11 (ME SR-11), hence northeast to the intersection of ME SR-212. Trucks will travel southeast along ME SR-212 to Oakfield, (where it turns into Smyrna – Oakfield Road) and enter Interstate 95 (I-95) traveling east to Houlton and the Canadian-US border and proceed to the Canadian National Highway in Woodstock New Brunswick. These roads are more specifically described below:

- 5.1 miles of gravel roads (consisting of an unnamed road, Pleasant Lane Road, and Bear Mountain Road). Elevations from the Pickett Mountain site to Maine (ME) state route (SR)-11 drop from approximately 1200 to 850 feet mean sea level (MSL) from west to east.
 - Existing gravel roads are currently in good condition, and well maintained for logging operations conducted on and around the property. An agreement is in place with land owning neighbors to allow right of way using this set of gravel roads outside of the Wolfden property boundary. Confirmation of the right of way is in the form of a letter within this report. Confirmation of right to upgrade and maintain is established in the

original agreement between both companies registered on April 2, 2020 in book 6000 on page 29.

- The gravel roads are single lane varying in width from 10 to 15 feet with drainage ditches where elevated. One bridge crossing is present.
- The permanent bridge crossing at Pickett Pond outlet, consists of concrete abutments with two layers of wood decking and steel beams for support. The bridge deck is approximately 15 feet wide with a 20 feet span. The bridge appears to be in good structural condition.
- Intersection of the gravel road with ME SR-11 has a good turning radius. The gravel road width at the shoulder of SR-11 is approximately 55 feet.
- There is no available traffic data for the gravel roads mostly used for logging traffic in addition to access to a seasonal camp on the south side of Pleasant Pond.
- The gravel roads are also used for recreational purposes by the public including all-terrain vehicles (ATVs) and snowmobiles.
- 19 miles of 2-lane rural state highway from the intersection of Bear Mountain Road with ME SR-11 to the intersection of Smyrna – Oakfield Road with I-95 (including 7.3 miles along ME SR-11 and 10.3 miles along ME SR-212, and 1.4 miles along the Smyrna – Oakfield Road). ME SR-11 and ME SR-212 are characterized by rolling hills ranging in elevation from approximately 550 to 1150 feet MSL. Posted speed limits are 50 MPH on ME SR-11 and 45 MPH on ME SR-212, and 35 MPH on the Smyrna-Oakfield Road. Each road has an approximate 11 feet wide travel lane with 3-foot shoulder in both directions.
 - Roads are in good to fair condition and include bridge crossings over West Branch of Mattawamkeag River on ME SR-11 and over East Hastings Brook on MR SR-212.
 - Average Annual Daily Traffic (AADT) presented on Maine Department of Transportation (Maine DOT) website ranged from 470-1270 along ME SR-11 and ME SR-212 in 2015. Ten crashes were reported from 2017-2019 at intersection of Clark Road and SR-212 in town of Merrill according to Maine DOT Crash Portal. The Level of Service is A (light & free flowing) on all state roads within the route.
 - Intersections along state routes have good turning radiuses.
- 9.1 miles of US Interstate Highway (I-95) from SR-212 to US-Canada border, with a posted speed of 75 MPH, 10-foot right shoulder both directions.
 - Road is in good condition.
 - AADT data from Maine DOT website ranged from 1480-2470 in 2015, 78 crashes along I-95 section from 2017-2019 according to Maine DOT Crash Portal with most assumed as animal collisions, with a Level of Service of C (stable).
 - On-ramps to be used along proposed route have good turning radiuses.

20.1.3 Traffic Increases

- Proposed traffic to the Pickett Mountain site includes a peak 66 workers per shift with two shifts per day offset by one hour. This results in a maximum of 132 peak hour trip/ hour during shift changes on ME SR-11. It is expected that the majority of workers employed at the mine will be

from local work force, many of whom may currently use portions of this route for current employment.

- Maine DOT requires a traffic permit to be obtained if traffic to be added to a route is greater than or equal to 100/hour. Proposed traffic increase may require a traffic permit.
- The daily traffic to and from the site (assuming 66 workers and two shifts/day plus 7 shipments of concentrate) results in 215 additional trips/day on ME SR-11 (an average of 9 vehicles/hour. The road has an hourly capacity of 1800 vehicles, and its use is currently well under that capacity.
- Shipping of concentrate via trucks will only occur during daytime hours.

20.1.4 Impacts

The proposed route for hauling concentrate consists of state and federal highways. The weight limit will be restricted by the Federal Interstate which allows a maximum of 80,000 pounds (lbs.) for both five and six axel tractor trailer configurations. State roads allow up to 88,000 lbs. for 5 axel configurations for certain commodities including unconsolidated rock material. Planned weight load will be 80,000 lbs. The private gravel roads are constructed for logging trucks with the similar weight constraints.

As identified previously, on average 9 truck shipments of concentrate will occur daily. This small level of increased traffic will not burden or impact proposed traffic route.

The additional volume of traffic may require a traffic permit but will not represent a burden or impact on the existing traffic capacity of the proposed route.

An easement has been agreed to between Wolfden and Herbert C. Haynes and Lakeville Shores, Inc., which is confirmed by letter in **Exhibit 20 - Attachment B Road Access and Easement to Route 11 in Hersey, Maine.**

20.2 Anticipated Improvements

20.2.1 Unimproved Gravel Roads

The road width currently ranges between 12-15 feet. Based on Maine DOT "Lane Width and Shoulder Width – C1" dated November 10/2010, a minimum road with of an HCP 6 roadway, with a speed limit of less than 40 mph, is 11 – 12 feet with a 1-3 feet shoulder per lane or a total minimum of 22-25 feet with a 2-6 feet shoulder. To support safe travel of additional traffic, road widths will be expanded to meet MDOT Standards along with some additional clearing of up to 10' on each side of the roadway in areas where visibility is constricted. A total of 18 feet (inclusive of the 10' visibility clearing) of clearing will be completed along the one side of the access road to accommodate the overhead power line.

Improvements on existing gravel roads will be conducted to improve year-round use, safe passage of vehicles on a single lane road and public safety.

- Maintenance of spring thaw impacts along the gravel roads will be undertaken by Wolfden. Wolfden will evaluate the scope of maintenance and improvements during the design analysis for the mine under the mining application (mine design and permitting phase).
- During the mine design analysis widening of the gravel roads will be evaluated for safe passage of logging trucks, concentrate trucks, and workers. A maximum width between 22 and 25 feet to the road shoulder should be sufficient for safe passage of large vehicles and recreational traffic (ATVs and snowmobiles in winter).

- During that analysis, consideration will also be given to providing a separate lane for safe passage of recreational vehicular traffic (ATVs and snowmobiles).
- Maintenance of bridge decking at Pickett Pond outlet crossing, may include improvement or replacement of the wood decking as dictated by normal wear and tear of truck traffic. The bridge currently handles traffic from logging trucks and consists of a single 15-foot lane. Traffic over the bridge will be managed with traffic controls consisting of traffic lights as well as signage ("Single Lane Bridge Ahead" and "Traffic Signal Ahead") on both approaches to the bridge to allow only single-direction traffic over the bridge at a time. The exit from the bridge on each end of the bridge will transition to a full two-lane width to allow traffic from the bridge to pass safely by vehicles stopped in the opposite lane.
- A cooperative road maintenance agreement, in general, will be established between Wolfden and commercial loggers whom access their own private property as well the Wolfden property.
- Appropriate signage and if required for traffic management, traffic lighting systems will be utilized throughout the length of the traffic gravel roads.

20.2.2 Rural State Highways

Potential Improvements to state highways will be for traffic safety. Wolfden will hire an MEDOT approved transportation engineer familiar with the area to consider, evaluate and design improvements, as needed, during the mine design and permitting phase. These improvements will include:

- Signage will be added to the approaches to the intersection of Bear Mountain Road and ME SR-11 indicating truck entering and leaving Bear Mountain Road (i.e. "Trucks Turning and Entering").
- Overhead lighting will be added at the intersection of Bear Mountain Road and ME SR-11 to provide illumination at the intersection.
- Paving of the entrance to Bear Mountain Road for the full width of the entrance and minimum of 50 feet from the intersection.
- Addition of 12-foot deceleration and acceleration lanes at the intersection of Bear Mountain Road and ME SR-11 for trucks to avoid obstruction of traffic during acceleration and deceleration periods. The deceleration and acceleration lanes will be designed in accordance with MEDOT standards based on the road grades and speed limits.
- Widening right shoulder to a minimum of 6 feet wide for 200 feet at the intersection of ME SR-11 and ME SR-212 in Moro Plantation to facilitate right turning truck traffic.
- Providing portable Changeable Message Signs for SR 212 to provide traffic information to mine employees, haul trucks, and the public as needed.

20.2.3 Summary

The proposed traffic route (**Figure 20-1**) and additional traffic levels do not constitute an impact on the existing road infrastructure. Wolfden will work with stakeholders (LUPC, the public, commercial loggers, and MEDOT) to accommodate modifications to ensure public safety and recreational access along the proposed private and state highway routes.

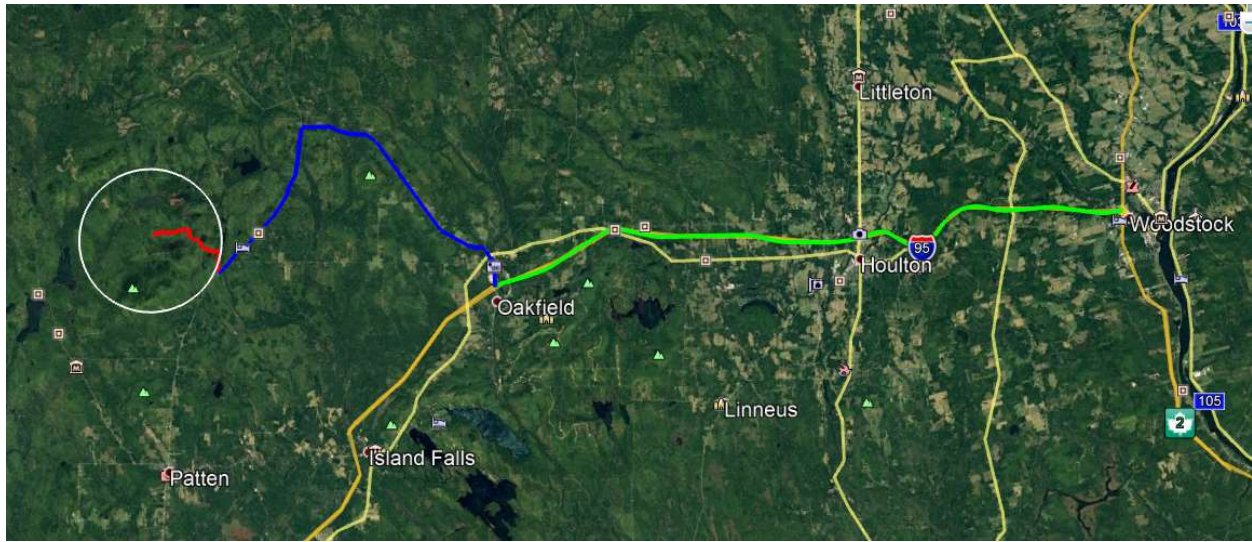


Figure 20-2: Proposed Concentrate Truck Haulage Route

Proposed Truck Route from Pickett Mountain Site with unimproved gravel roads in red, 2-lane rural state highways in blue, and US Interstate Highway in Green. An approximate three-mile radius is drawn around the site (white).

Wolfden Mt. Chase LLC

Exhibit 20: Attachment A - Figures

Exhibit 20 Figures Include:

Figure 20-1 – Transportation Route

Wolfden Mt. Chase LLC

Exhibit 20: Attachment B - Reports

Exhibit 20 Supporting Documents Include:

Dean A. Beaupain, Esq. – Road Access and Easement to Route 11 in Hersey, Maine

Wolfden Mt. Chase LLC

EXHIBIT 21 – SITE ACCESS/LEGAL RIGHT OF ACCESS

21 SITE ACCESS/LEGAL RIGHT OF ACCESS

21.1 ACCESS TO SITE

a. Starting with the closest public road, then each successive road, provide the following information about each existing road that will be used to access the area proposed for rezoning.

<u>Road Name</u>	<u>Public or Private (if Private, complete rest of the row)</u>	<u>Owner Name</u>	<u>Length and Travel Width of Road</u>	<u>Right of Way Width</u>	<u>Type of Wearing Surface</u>
<u>See Exhibit 20</u>	<u>Private</u>	<u>Wolfden Mt. Chase</u>	<u>5.1 mi/15 ft</u>	<u>NA</u>	<u>Gravel</u>

b. Water Only Access- Not Applicable

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EXHIBIT 22 – SOIL SUITABILITY

22 SOIL SUITABILITY

Figure 22-1 provides available low intensity soil information. The soils present are derived from glacial till deposited over bedrock. A limited on-site mapping of soils has been conducted by Atlantic Resources Consultants. The detailed soils report as well as an additional soils memorandum are provided in **Exhibit 22 -Attachment B**. More detailed soil mapping and hydrogeologic characterization will be required to design monitoring systems, determine an appropriate location for a domestic wastewater septic field, and to design and size the infiltration galleries for re-injection of treated water back to groundwater. These studies will be detailed in nature and implemented as part of the baseline and background studies to support detailed design of the above ground facilities.

The current design of the Pickett Mine development addresses potential soil limitations. The concept layout and design employs the engineering methods and practices recommended in the original soil evaluation to identify and address any potential limitations posed by the soil conditions. The limited site-specific soils information available at this phase of the rezoning process will be supplemented with additional detailed site-specific information that will further refine the design as the project moves forward. Ultimately, the nature of a resource-specific operation location requires the siting of facilities and infrastructure as near to the mineral resource as possible. Where limiting soil conditions are unavoidable, these methods identified can mitigate the impacts. The conceptual layout maintains the natural groundwater flow through the site, minimizes blasting, limits development in soil areas with a seasonal high-water table and avoids the most unsuitable soil areas with wetlands and steep slopes. The project site layout does not require blasting of a shelf for construction of infrastructure, water collection ponds, pads, or the TMF. A material balance has been generated and fill volumes calculated and are well below anticipated fill requirements outlined in the PEA.

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Exhibit 22: Attachment A - Figures

Exhibit 22 Figures Include:

Figure 22-1 Low Intensity Soils Map

Wolfden Mt. Chase LLC

Exhibit 22: Attachment B - Reports

Exhibit 22 Supporting Documents Include:

Wood/Atlantic Resource Co, LLC – Wolfden Soil Suitability Evaluation Report 11 9 20

Atlantic Resource Co, LLC – Soil Memorandum22105015 Draft

Wolfden Mt. Chase LLC

EXHIBIT 23 – SEWAGE WATER DISPOSAL

23 SEWAGE WATER DISPOSAL

Human sewage from the underground operations will be collected in portable toilets and serviced by a local contractor. Human sewage generated from the surface operations will drain to a typical septic system located on the site down gradient of the infrastructure and site potable water supply. If site conditions warrant (i.e., insufficient depth to a restrictive layer), a mounded subsurface wastewater disposal system could be constructed. **Figure 2-6 (Exhibit 2 – Attachment A)** contains a typical detail for a mounded subsurface wastewater disposal systems.

Wolfden Mt. Chase LLC

**EXHIBIT 24 – ARCHAEOLOGICAL AND HISTORIC
RESOURCES**

24 ARCHAEOLOGICAL AND HISTORIC RESOURCES

24.1 Historical Sites

A phase 0 study was designed to identify all areas that are sensitive for the presence of Native American or historic Euroamerican archaeological sites both within the mine project area and also at selected locations along the access roads that may be subject to improvement as needed, or to show that archaeological sites of potential significance are not likely to be present. Significant archaeological sites are those that meet eligibility criteria for listing on the National Register of Historic Places (NRHP). The assessment was conducted as part of the Maine LUPC permit application process, and meets guidelines and requirements determined by the Maine Historic Preservation Commission (MHPC).

The phase 0 study concluded that the area is not considered sensitive for the presence of historical period archaeological resources. The Maine State Historic Preservation Office has been consulted to identify any known or suspected historical sites on the property. A stone tool archeological habitation site is known near the headwater of Pickett Pond. Given this information, a Phase 0 Assessment included background research and a field inspection was completed by NE ARC Assistant Director, Dr. Gemma Hudgell. Background research considered various 19th and 20th century maps of the area, contemporary topographic and bedrock/ surficial geological maps, and review of MHPC site files associated with previously identified site 147.001. These resources confirmed the potential presence of toolstone geological resources within the project area, possibly including chert and fine-grained volcanics. The field inspection was also conducted by Dr. Hudgell

Background research and field inspection indicates that the project area contains three areas of outcropping "cherty rhyolite", which is a knappable lithic material of a type known to have been used by Native Americans to make stone tools. The artifacts from the nearby previously identified Native American site, 147.001, may be of this material, or a very similar type. The project also possesses archaeological sensitivity for Native American archaeological habitation sites based on the presence of a fairly level till bench terrace located above Pickett Mountain Pond in the southeastern portion of the project. ~~The site topography will be regraded and revegetated to mimic the original landforms, including the tailings facility whose profile will be below the surrounding tree line.~~

and given the identification of site 147.001 within 250 m of the southern boundary of the project on a similar landform near the head of the same pond.

With all inputs considered, the project area is not considered sensitive for the presence of historic period archaeological resources and a Phase 1 survey could be recommended when Wolfden continues to the next phase of background study testwork and permitting for the DEP. A formal detailed report is shown in **Exhibit 24 - Attachment B Archaeological Phase 0 Assessment for the Proposed Pickett Mountain Mine Project T6R6 WELS, Penobscot County, Maine.** In a report dated September, 2020, Dr. Speiss, Senior Archeologist with the Maine Historic Preservation Office, noted that the Phase 0 report was acceptable and useful and that with appropriate follow-up, no impacts to archeological sites were expected.

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Exhibit 24: Attachment B - Reports

Exhibit 24 Supporting Documents Include:

Archaeological Phase 0 Assessment for the Proposed Pickett Mountain Mine Project T6R6 WELS, Penobscot County, Maine.

Wolfden Mt. Chase LLC

**EXHIBIT 25 – RARE OR SPECIAL PLANT COMMUNITIES
AND WILDLIFE HABITAT**

25 RARE OR SPECIAL PLANT COMMUNITIES AND WILDLIFE HABITAT

25.1 Introduction

Studies and work completed so far on the proposed Pickett Mountain project site have included desktop review of state and federal data bases related to rare, threatened and endangered species and special/critical habitat, reconnaissance level flora and fauna observations during wetland surveys, and on-site evaluation of potential presence of Clayton's Copper Butterfly and the Shrubby Cinquefoil. The following sections discuss findings related to wildlife and plant communities and habitats.

25.2 Wildlife Habitats

The property contains a mix of terrestrial and aquatic habitats, including forested uplands, forested and scrub shrub wetlands, rivers, streams, ponds and lakes. The majority of the property is forested composed of a mix of deciduous and evergreen trees. Wildlife common to the Northwoods include deer, moose, bobcats, fishers, as well as a number of small mammal species. Avian species including passerine birds, accipiter's and buteos, and piscivorous birds such as kingfishers and herons are also common, as are waterfowl including ducks, geese, and loons. The area proposed for development is primarily upland forested habitat, co-dominated by deciduous trees (i.e., beech, birch, and red maple trees) and coniferous trees (i.e., spruce, fir, cedar and hemlock). The area has been extensively logged in the past five to ten years (prior to Wolfden acquisition) and is currently in re-growth. Portions are currently being harvested. Evidence of past logging operations in the form of skidder trails and logging roads are common throughout the area proposed for rezoning and development. The forest understory is relatively open and lacks dense growth commonly found in recently cut forest. Wildlife are accustomed to logging activities in the Northwoods, and the mine operation is not expected to have a significant different impact on most wildlife species than occurs with common logging operations. Blasting is an operating function that will occur with mining that does not occur in typical logging operations but blasting at the surface during construction will be limited in duration to the opening of the mine portal and once completed, underground blasting would be an ongoing activity that would have a minimal surface expression and minimal potential effect on wildlife. Specifically, it would be confined to a small area above the ore zone and would be a periodic and short duration event, and the sound and vibration impacts do not extend beyond the immediate rezone area.

Correspondence was sent to the Maine Department of Inland Fisheries and Wildlife (November 6, 2019) to obtain a State list of Rare, Threatened, or Endangered species that could potentially be found in the area. The MDIF&W provided a preliminary response to this request on November 25, 2019 which indicated there were no known occurrences of State endangered, threatened or special concern species within the project area. The correspondence is provided in **Exhibit 25 - Attachment B IF&W Information Request – Wolfden Resources Metallic Mineral Mining Rezoning, T6R6 WELS.**

In addition, there are no mapped significant wildlife habitats within the project area, although in its September 2020 additional observations and recommendations, the MDIF&W noted the presence of a designated inland Waterfowl and Wading Bird Habitat-- (IWWH) adjacent to the rezone area near Pickett Mountain Pond. **Figure 25-1 (Exhibit 25 - Attachment A)**, identifies significant natural resources and sensitive natural areas located within a three-mile radius of the site.

The project will not impact that significant wildlife habitat. MDIF&W noted the potential for the presence of shrubby cinquefoil in the IWWH, which is the host plant for the threatened Clayton's Copper butterfly. As discussed below, based on a site visit with MNAP it was determined that the Shrubby Cinquefoil was not present there. Additional surveys, to the extent recommended by MDIF&W, will be undertaken during the MDEP mining permit baseline surveys. MDIF&W did identify Great Blue Heron colonies as species of concern and noted the special protection afforded to eight species of bats and concern for habitat protection. However, the preliminary reconnaissance conducted to date did not identify habitat that would support Great Blue Heron colonies or bats within the rezone boundary, the latter due principally to very limited and small exposures of bedrock outcrop and lack of talus slopes. A detailed assessment of terrestrial fauna will be completed under baseline studies required by MDEP Chapter 200 regulations, including a detailed survey of the area proposed for development, for individual species and or suitable habitat for the species identified.

MDIF&W also highlighted the importance of protecting aquatic resources including Pleasant Lake and Mud Lake as well as other high value stream resources in the area. As discussed below, there are no activities that will occur within the surface waters or an undisturbed 75-foot buffer around surface waters in the rezone area. Additional, as discussed in **Exhibit 10**, the water treatment and water management plans will ensure there are no adverse impacts to the water quality and aquatic resources in the project area.

A detailed delineation of wetlands, streams and vernal pools within the rezone area has been conducted (As shown in **Figure 2-1**). Based on that survey a 75-foot buffer around these protected natural resources has been established and was used during the proposed layout and design of the facilities. The site development occurs outside that 75-foot buffer zone. The project does not impinge on shorelines of any lakes or ponds within the Wolfden owned parcel; and there are no shorelines of any lakes or ponds within the rezone footprint. Therefore, impacts to riparian zones around water bodies, associated birds and waterfowl are not anticipated. ~~The IF&W provided a correspondence on November 25, 2019 which indicated there were no known occurrences of endangered, threatened or special concern species within the project area (Exhibit N). The IF&W also has not mapped any significant wildlife habitats within the project area. The IF&W did identify Great Blue Heron colonies as species of concern and noted the special protection afforded to eight species of bats and concern for habitat protection. The preliminary screening survey conducted to date did not identify habitat that would support Great Blue Heron colonies or bats, the latter due principally to very limited and small exposures of bedrock outcrop and lack of any talus slopes. When the detailed mapping of wetlands, intermittent streams and vernal pools is conducted in the spring it will include a final species assessment encompassing a survey of the area proposed for development individual species and or suitable habitat for the species identified. Impacts to rare, threatened or endangered wildlife are not known or expected and if identified~~Impacts to rare, threatened or endangered wildlife are not expected at this time. However; if identified in future studies they will be avoided and minimized; to the maximum extent possible.

- a. ~~Sufficient Land Area:~~ The project proposed area for rezoning, based on revisions necessary to address LUPC comments dated March 6, 2020, includes a total 528.2 acres. The project will manage all tailings in the above ground dry stacked tailings facility. In order to accommodate tailings placement, compaction and closure in a manner that minimizes vertical height of the placed tailings and allows the final closed facility to mimic the existing ridgeline, the tailings facility will occupy approximately 91.7 acres. The wastewater treatment plant and infiltration galleries (Potential Disposal Points or PDPs) are in the south eastern portion of the site. The four PDPs occupy a footprint in excess of 5 acres. Collectively the mine facilities (Mill feed storage pad, waste rock staging area, Concentrator, offices etc) occupy a footprint of approximately 7.3 acres. The area between these facilities contains upland wetland resources and will not be developed. Underground ventilation facilities are in the southwestern portion of the site. When a 400 foot buffer was developed around the locations of these collective facilities, that buffer occupies approximately 347 acres. To simplify the shape of this resulting area needed for rezoning a polygon was drawn around the corners and extremities of the buffer zone; and this has resulted in the final proposed area for rezoning of 528.2 acres. This difference (approximately 181 acres) provides appropriate flexibility during subsequent development, design and permitting review, to adjust the proposed facility, including avoidance, to the extent possible, of natural resource impacts such as wetlands and vernal pools once mapped. The additional area would also allow adequate space to locate and develop a renewable energy asset (solar farm) if future evaluations indicate such a facility is viable, and other project needs including parking and domestic wastewater facilities.

The project wastewater management plan includes a sophisticated water treatment plant for industrial waters (mine waters and contact water) as described in Appendix A section B(3)(d). Grey water and black water will be managed through a contracted disposal service for below ground and an on-site septic for above ground facilities.

e. ~~High Yield Sand and Gravel or Bedrock Aquifer:~~ The proposed facility is not located near a high yield sand and gravel aquifer nor a high yield bedrock aquifer. Please see Appendix A Attachment I. All contact waters will be collected and treated prior to discharge ensuring that recharging waters will not impact overburden and bedrock groundwater resources as discussed in Appendix A Section B(3)(d). During mine development and mine operation bedrock groundwater movement is toward the mine workings since they will exist in a dewatered state. Sulfides present in bedrock below the water table are in a reducing state and will not be oxidized. USFW Service identified three species of concern that could be in the area including the Canada Lynx, Northern Long-Ear Bat and Atlantic Salmon. As noted by USFW, these federally listed RT&E species would need to be evaluated and considered, should a federal nexus occur as part of the project. A discussion of each of these follows.

Canada Lynx (*Lynx canadensis*)

The proposed project will impact roughly 26% (158.6 acres) of the 600.1 acres proposed for rezoning. The area is in the southern limit of the range for Canada Lynx and is within mapped critical habitat. Significant portions particularly within the northern portion of the state are mapped critical habitat. Regarding the Canada Lynx the site does not have significant areas of dense undergrowth that are currently favorable habitat for snowshoe hares (primary prey item of Canada lynx) and provide possible den sites. The area proposed for development has been logged within the last 5 to 10 years and is currently in regeneration, which is not a preferred habitat for the lynx. Lynxes prefer older stands (11 to 30 years-old) formerly clear cut or partially harvested regenerating forest (McCollough, 2007). The area proposed for development is dominated by poplars, beech and maples and has a relatively open understory. There are portions of the proposed development and areas surrounding the proposed development that are densely vegetated with spruce and fir. These areas of dense evergreen growth occur predominantly in the wetter areas on the site, which were either avoided when cut or have grown back with evergreens being the dominant trees. The home range for the female and male lynx are 6,550 acres and 14,300 acres, respectively. The proposed project would potentially impact only up to 2.4% of the female's home range and 1.1% of the male's home range. This potential loss of habitat is not expected to adversely impact the species because it represents such a small portion of their overall range and there is significant and higher-value habitat in the region.

To protect against the risk of wildlife becoming entrapped in on-site storage ponds or pads, fenced features within the proposed project will be designed to allow for passage of entrapped animals with the use of "jump outs" and other common wildlife passage techniques. Traffic along the access roads represents a potential risk to the Lynx. Wolfden will work with resources agencies and other property owners to establish speed limits that minimizes the collision risk to Lynx.

McCollough, 2007. Canada lynx habitat management guidelines for Maine, USFWS Maine Field Office, 1168 Main St, Old Town, Maine 04468, September 13, 2007.

Northern Long-eared Bat (*Myotis septentrionalis*)

As noted, the proposed project will impact approximately 158.6 acres of forest habitat, of which the majority has been logged in the past 5 to 10 years. The current forest does have limited number of mature tree habitat for bat roosting. To minimize impacts to bats and improve bat habitat in the future the following measures will be included in the forest management plan that will be developed during the mine permitting phase:

- keep standing dead and dying trees as well as a portion of large mature trees (i.e., >24in DBH) on the remaining undeveloped land to the extent practicable;
- install bat houses and roosts around the proposed development envelope to replace lost roost habitat (large mature trees) removed for the proposed development, and
- limit tree removal on the proposed development envelope to between November 1st and April 14th.

Once mining has been completed and in coordination with the MDIFW the portal opening to the former mine will be left open (i.e., not completely sealed) to allow for future use by bats as potential hibernaculum. The opening will be affectively sealed to keep out trespassers.

Atlantic Salmon (*Salmo salar*)

There are several streams in the vicinity of the proposed project outside of the rezone area that been "modeled" to provide suitable Atlantic Salmon habitat. Modeled means that Atlantic Salmon could potentially reach these streams if there were no obstructions (i.e., dams) that currently prevented them from doing so. Currently there are several dams between the modeled habitat and downstream locations where Atlantic Salmon can migrate to or have been stocked. There is a barrier to upstream migration on Rockabema Lake and other dams downstream on the West Branch of the Mattawamkeag in Island Falls and below. Therefore, it is unlikely that Atlantic Salmon could migrate to the modeled habitat. Nonetheless, the project incorporates a number of measures to ensure that streams that might provide future habitat for Atlantic Salmon are not adversely impacted. Specifically, no in-stream work is proposed thereby avoiding any direct impacts to surface waters. Additionally, it is expected that there will not be any clearing or other project impacts within a 75-foot buffer around any intermittent streams and wetlands within the rezone area. If any clearing within the buffer is required based on the data collected as part of the complete baseline surveys and final project design, it will be limited in nature and will minimize removal of overstory and reflect appropriate measures to prevent erosion. Finally, as discussed in Exhibit 10, the water management plan ensures that there will be no impacts to surrounding surface waters as a result of mining operations.

Although the project is not expected to have any direct or indirect adverse impacts to surface waters that might provide habitat for Atlantic Salmon in the future, Wolfden recognizes the importance of the species and the efforts in Maine the restore this fishery. As with the lynx and bats, Wolfden agrees to work with MDIF&W, USFW, and other resources agencies to determine measures that could be implemented to protect and improve the current habitat on Wolfden land. Potential improvements could include: 1) providing permanent conservation easements to protect areas around the modeling river and stream habitats, 2) upgrades to existing culverts and stream crossings within the modeled habitat areas based on the latest stream crossing best management practices for fish passage (i.e., pipe culverts could be replaced with oversized open bottom box culverts).

Finally, some area outside the proposed development area and within the approximately 6,500 other acres that Wolfden owns, acres could be managed for Canada Lynx habitat in the future, following the USFWS guidance "Canada lynx habitat management guidelines for Maine" (McCollough, 2007). Future forestry management plans and practices on the remaining 6,499-acres that Wolfden owns, could be managed in the future to develop forests favored by Canada Lynx and its primary prey item the snowshoe hare. These include managing for landscapes dominated by softwood-dominated mid-regenerating stands. Wolfden commits to working with the MIF&W and USFW during the mine permitting phase to develop a forest management plan that includes Lynx habitat improvement as one of its goals.

25.3 Plant Habitats

The area proposed for development includes upland forested habitat and as noted has been logged in the past 5-10 years. The forest habitat includes a relatively open understory dominated by saplings of the dominant tree species. Shrubs are also present in the forested. The herbaceous growth in the forest habitat includes moss, ferns, grasses, and sedges.

Correspondence with the MNAP was submitted to request a list of known or suspect rare, threatened or endangered plants occurring in the area. -The MNAP This aspect of hydrologic control further protects bedrock groundwater resources. Existing groundwater quality in bedrock will be characterized as part of the background study for MEDEP permitting and will be the basis to evaluate and remediate any impacts should they occur.

18. NATURAL AND HISTORICAL FEATURES.

- ~~1~~ Provide as **EXHIBIT M**, either a Phase 1 archaeological survey or a letter from the Maine Historic Preservation Commission that a Phase 1 archaeological survey is not necessary. See page vi of the instructions for more detail regarding this exhibit.
- ~~1~~ Provide as **EXHIBIT N**, letters from the Maine Natural Areas Program AND Maine Inland Fisheries and Wildlife confirming the presence or absence of rare or special plant communities or significant wildlife habitat in the area of the rezoning. See page vi of the Instructions for additional detail regarding this exhibit.

Please see Exhibits M and N for requested information.

- A. A phase 0 Archeological study has been completed throughout the proposed footprint by Gemma-Jayne Huggell, Ph.D. of Northeast Archaeology Research Center, Inc. This is discussed further in Appendix A.
- B. The MNAP has provided an environmental review for rare and exemplary botanical features in proximity to the Pickett Mountain Project. is provided in **Exhibit 25 - Attachment B Rare and Exemplary Botanical Features in Proximity to: Wolfden Pickett Mountain Site, T6R6 WELS, Maine.** The MNAP response indicates that there are no rare botanical features documented specifically within the project area. MNAP identified a lakeside graminoid/shrub fen located between Pleasant and Mud Lakes. These are outside the rezoning area and would not be affected by proposed activities. In addition, on October 1st 2020, MNAP participated in a site visit with focus on the State threatened Clayton's copper butterfly as well as suitable habitat, specifically the Shrubby Cinquefoil plant. A memorandum summarizing the October 1st survey is provided in **Exhibit 25 - Attachment B LUPC Memo Pickett Mtn Pond Butterfly**. Based on current information and reconnaissance, rare and exemplary botanical features have not been observed or are not known or expected to exist in the area proposed for rezoning. ~~During the Spring of 2020, surveys will be made by a qualified biologist to ensure that no undocumented rare or exemplary~~ If such botanical features are present that would be inadvertently harmed.

The MIL&W has also provided an environmental review with similar findings, that significant wildlife habit is not known or expected at the project site.

Relevant correspondence is provided in Exhibit N.

19. RECREATIONAL RESOURCES.

The area in the immediate vicinity of the proposed rezoning has limited high value recreational resources (cold water fisheries, scenic views, primitive and remote locations) and is privately owned. Public recreation use of the area is primarily motorized, accessing existing gravel logging roads including ATVs and snow mobiles. Wolfden would affirmatively impose restrictions on certain roads that lead to the mine site, if needed for public safety. The roads providing access to the site are already well developed and used extensively by logging operations. Recreational resources within 3 miles of the area proposed for rezoning are depicted and further described in Appendix A Attachment L.

Nearby designated recreational resources, including Lane Brook Pond, Green Mountain Pond identified as well as fish and wildlife protection subdistricts along portions of the headwaters to Upper Shin Pond, would not be affected directly by the project or indirectly through increased traffic. The tributaries to Upper Shin Pond are valued as stream spawning and nursery areas for brook trout and the thoroughfare to Lower Shin Pond for salmon. These areas are not within the watershed drainage of the proposed site. Upper and Lower Shin Pond are accessed by Route 159 which is not connected to any existing private or public roads used to access the site. The proposed site would not increase traffic to these areas. These recreational resources are used by anglers in spring and summer months and by hikers and motorized recreational vehicles year round. These recreational resources would also not be affected by the project; and the project, based on current information, would not be visible from those areas.

One of the parcels of the Katahdin Woods and Waters National Monument is located approximately 6.3 miles to the southwest just south of Lower Shin Pond and extends over to the Seboeis River approximately 9 miles from the site. This area is accessed by several unimproved roads off Route 159 that include scenic overlooks, picnic areas and an unimproved boat launch on the river. The proposed site would not increase use of these recreational resources. Neither would the site be visible from scenic viewpoints within the Monument.

The East Branch of the Penobscot River is located fifteen miles southwest of the site and is the eastern boundary of the largest parcel of the Katahdin Woods and Waters National Monument. Within the monument there are numerous recreational opportunities including hiking, fishing, camping, boating and biking; hunting and snowmobiling are permitted east of the East Branch of the Penobscot River. Mountain elevations in the Monument range from approximately 1,900 to 1,400 feet. The upland ridgeline where development is proposed at the site is approximately 1,200 feet in elevation and is surrounded by higher elevations to the northwest (Green Mountain 1,600 feet and Lane Brook Hills 1,500 feet) and to the south (Picket Mountain 1,700 feet), and to the southwest (Mount Chase 2,400 feet). Due to the surrounding elevations the site would not be readily visible from Upper or Lower Shin Pond, and vantage points from within the Katahdin Woods and Waters National Monument. The site would be within the line of sight from the summit of Sugarloaf Mountain, but at an extreme distance of 7.3 miles. Sugarloaf Mountain is located approximate 2 miles northwest of Lower Shin Pond and is not the same as the ski area located in Carrabassett Valley. The proposed mine site would not have visual or other adverse impacts on the scenic values of these recreational resources.

Development of the site would not increase traffic to these areas since they are accessed by roads not connected to the site.

~~20. PROSPECTIVELY ZONED AREAS:~~

~~Not Applicable~~

7

21. PLANNED DEVELOPMENT OR PLANNED RECREATION FACILITY DEVELOPMENT SUBDISTRICTS:

The proposed development will require permitting under Chapter 200 by the DEP. Rezoning approval is required by LUPC. This Petition addresses the additional requirements of the LUPC's Chapter 12 rules. The applicant has prepared this Petition in consultation with the LUPC and other relevant agencies. Please see **Appendix A – Attachment A** for a narrative description of the nature and basis for the requested subdistrict change.

~~22. ADDITIONAL INFORMATION.~~

~~Appendix A of this Petition contains additional information intended to provide a more detailed understanding of the proposed mining activities and their responsiveness to the requirements of the LUPC's Chapter 12 rules.~~

23. REQUIRED FEES, EXHIBITS AND SUPPLEMENTS.

Submit all necessary fees, exhibits and supplemental information with this petition, as described in the instructions.

CHECKLIST OF REQUIRED FEES, EXHIBITS, AND SUPPLEMENTS

Please check off the following for the fee, exhibits, and supplements. To determine which exhibits are required for your petition, use the highlighted notes (1) contained in certain items and the instructions in Required Fees, Exhibits and Supplements. Please check if the exhibit is required and if it has been provided, and note that the supplements may also require additional exhibits. Please check with the LUPC staff if you have any questions.

Required*	Provided	Exhibit	*Required
YES NO	YES NO		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> Pre-application meeting	Required unless otherwise indicated by the LUPC staff.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> Application Fee	Required unless a waiver is granted by the LUPC Director in very specific and limited circumstances.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> Exhibit A – Location Map and Digital Location Data	Location map required; digital location data is ideal.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> Exhibit B – Deed, Lease or Easement	Required unless already on file with the Commission and no changes have been made from what is on file.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> Exhibit C – Site Photographs	Required unless already on file with the Commission and photos are representative of current conditions.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> Exhibit D-1 – Existing Site Plan	Required. Show all existing and proposed structures and features, and existing and proposed subdistrict boundaries.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> Exhibit D-2 – Preliminary Site Plan or Subdivision Plan	Required if the proposed rezoning is intended to accommodate a subsequent subdivision; Optional if subsequent subdivision is not intended and if all proposed changes cannot be clearly shown on Exhibit D-1.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> Exhibit E – Flood Area Zoning	Required for any rezoning of a FEMA Flood Plain or a P-FP Subdistrict, if your answer to any part of item 10 b, c, or d is YES.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> Exhibit F – Notice of Filing	Required.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> Exhibit G – Protection Subdistricts	Required for rezoning to or from a P-AR, P-FW, P-SG, or P-WL.

The following exhibits may only be required for petitions that propose a development subdistrict:

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> Exhibit H – Financial Capacity	Required.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> Exhibit I – Corporate Good Standing	Required if applicant is a corporation.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> Exhibit J – Soil Suitability and Mapping	Required.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> Exhibit K – Wastewater Disposal	Required.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> Exhibit L – Impacts on Public Services	Required.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> Exhibit M – Archaeological Resources	Required.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> Exhibit N – Rare or Special Plant Communities and Wildlife Habitat	Required.

4 NOTICE OF FILING OF ZONING PETITION WITH THE MAINE LAND USE PLANNING COMMISSION

At the time a zoning petition is filed with the Maine Land Use Planning Commission, the petitioner must send by certified mail a completed copy of this notice to: all persons owning or leasing property abutting or within 1,000 feet of the property to be rezoned (as shown on the records of the Maine Revenue Service or plantation or town tax assessors); plantation assessors or town select board; and county commissioners. Note: if the number of persons owning or leasing land within 1,000 feet of the affected land is more than 50, notice may instead be by publication in a newspaper(s) of general circulation in the area affected by the petition as determined by the LUPC staff.

This is to notify you that Wolfden Mt Chase LLC
(name and address of petitioner)

has filed a zoning petition with the Maine Land Use Planning Commission, pursuant to provisions of 12 M.R.S.A. Section 685-A(8-A),

to rezone 197.5 acres of land located in T6R6 WELS Penobscot County, Maine
(name of town, township or plantation, and county)

from its present General Management Subdistrict (M-GN) designation
(name(s) of the existing zoning subdistricts)

to a Planned Development (D-PD) Subdistrict;

Pickett Mountain Mine Project

(name(s) of the proposed zoning subdistricts)

for purposes of: initial development, operation and closure of an underground metallic mineral mine.

The petition will be filed for public inspection at the Maine Land Use Planning Commission offices below

on 1/27/2020.

(specify the date that this petition will be filed with the LUPC).

<u>AUGUSTA OFFICE</u>		<u>EAST MILLINOCKET OFFICE</u>	
18 Elkins Lane - Harlow Bldg.	Tel. (207) 287-2631	191 Main Street	Tel. (207) 485-8354
22 State House Station	TTY (888) 577-6690	East Millinocket, ME 04430	Tel. (207) 399-2176
Augusta, ME 04333-0022	FAX (207) 287-7439		FAX (207) 746-2243

In accordance with the Commission's Chapter 12 rule, **a public hearing must be held** for this zoning petition. Details on the public hearing, including how to participate in the hearing, request intervenor status, receive future notifications, and the date the record closes, will be posted in a separate Notice of Public Hearing as soon as that information is available.

Public comments are welcome up until the close of the record after the hearing. The LUPC encourages interested persons to submit written comments on this petition electronically to the e-mail address Wolfdenrezoning.LUPC@maine.gov. Written comments submitted in hard copy should be sent to the Maine Land Use Planning Commission's Augusta Office address, attention: Stacie Beyer, and **must be received by the Commission in a timely manner.**

For additional information, contact Stacie Beyer at the Augusta Office, or through the project e-mail address listed above.

Exhibit A

Location Map and Digital Location Data

Exhibit B

Deed

Exhibit C

Site Photographs

Exhibit D-1

Existing Site Plan

Exhibit D-2

Preliminary Site Plan

The following plan provides a conceptual layout of the facilities and buildings associated with the project. The building designation, structure type and size are summarized below. In addition to buildings and other structures, it is anticipated that a 0.5 acre parking area will be required for employees with an additional 2.5 acres dedicated to parking for trucks and other equipment. Therefore, the total area to be cleared is 137.5 acres. The water collection and treatment systems will not collect precipitation around buried structures or office buildings but will collect run-off around other buildings, the tailings storage area, storage pads etc.

Name	SQ FT	Structure Type	Acreage	Notes
1	1,077	Building	0.02	Temporary Explosives Magazine
2	1,077	Building	0.02	Temporary Explosives Magazine
3	1,077	Vent Raise	0.02	Ventilation Exhaust Raise
4	1,077	Vent Raise	0.02	Ventilation Exhaust Raise
5	97	Buried Structure	0.00	Concrete Water Diffuser
Parking Facility	21,780	Impervious area	0.50	
Equipment Parking	108,900	Impervious area	2.50	
Site Road Infrastructure	157,252	Impervious area	3.61	
Conc Handling	29,874	Building	0.69	
Concentrator	64,619	Building	1.48	
Dry Stacked Tailings Facility	3,415,104	Lined Pad	78.40	
Fuel	2,126	Building	0.05	
Electrical Substation	10,000	Building	0.23	Electrical Substation
Laydown Area	70,000	Impervious area	1.61	
Laydown Area A	4,000	Impervious area	0.09	
Mill Feed Storage Pad	43,080	Lined Pad	0.99	
Office	2,423	Building	0.06	
Office A	485	Building	0.01	
Office B	97	Building	0.00	
PDP 1	148,104	Buried Structure	3.40	Septic Type System
PDP 2	104,544	Buried Structure	2.40	Septic Type System
PDP 3	200,376	Buried Structure	4.60	Septic Type System
PDP 4	100,188	Buried Structure	2.30	Septic Type System
Solid Waste Septic System	10,000	Buried Structure	0.23	Solid Waste Septic Bed and tank
Portal East	11,821	Excavation	0.27	
Shop	6,462	Building	0.15	
Warehouse	8,000	Building	0.07	
Waste Rock Storage Facility	69,143	Impervious area	1.59	
Waste Water Storage	16,155	Impervious area	0.37	
WTP	1,615	Building	0.04	
Total Buildings Area	127,855	SQ FT	2.83	Acres
Total Lined Pads Area	3,458,184	SQ FT	79.39	Acres
Total Impervious Area	447,229	SQ FT	10.27	Acres
Total Impacted Area	4,610,551	SQ FT	105.73	Acres
Total Cleared Area	5,993,717	SQ FT	137.45	Acres

Exhibit E

**Flood Area Zoning
Not Applicable**

Exhibit F
Notice of Filing

~~TO BE PROVIDED UNDER SEPARATE COVER~~

Exhibit G

~~Protection Subdistricts~~
~~Not Applicable~~

Exhibit H

Financial Capacity

Financial Capacity

Funding for the Pickett Mountain Mine project to date has been a combination of small equity raises and timber sales from the property. Wolfden's market capitalization will be an important factor for its ability to fully finance the construction of the project. Wolfden, like other base metal focused mining companies trades at a discount due to lower investor interest in the base metal commodity sector. In addition, Wolfden is the first company in years to attempt to build a metallic mine in Maine and as a result, investors may be more cautious to invest in the project until the principle regulatory requirements (such as rezoning, baseline studies, feasibility studies, and a mining permit) have been successfully completed. We anticipate they will be avoided, and that this trend will continue for the project until milestones like the rezoning have been achieved and the project is proceeding well through its baseline studies.

Typically, mining projects are funded through a combination of project debt and equity whether the company is large or small. For small mining companies, the equity portion of the project financing is usually raised through several share issuances as the project completes the principle milestones as those listed above, such as the 1) Full Feasibility Study with a positive outcome; 2) Mine permitting approvals; 3) Approval of a project debt facility with a lead financial arranger; and 4) Positive results from any ongoing exploration that indicate the potential for additional resources.

Currently, Wolfden is actively exploring while in parallel pursuing a rezoning petition. Success on both of these fronts will significantly de-risk the project and thereby improve investor comfort in the project and in the future of metallic mining in Maine. Wolfden's two largest shareholders (Kinross and Altius) are larger mining companies with the financial capacity to finance the construction of the project. Similar to small investors, these larger investors could be interested in a partnership to develop the project or even a take over of Wolfden so that they can develop the project themselves. There are other larger mining companies that continue to follow Wolfden's efforts and success in Maine who may also be interested in either approach as the project receives approvals on the milestones listed above.

The project financing will be based on a financial model (as included in the Costs and Revenues section and an attachment) that will evolve further with more detailed drilling, baseline studies and feasibility work. The current financial model shows the project to be positive. Wolfden estimates that additional resources can be further defined at depth and within close proximity to the deposit that can further improve the financial returns and life of the project. The Company plans to continue with exploration and delineation drilling in parallel with all study work over the next two to three years. In addition, Wolfden has commissioned a third party engineering firm to produce a Preliminary Economic Assessment (PEA) which is typically completed before a Prefeasibility Study and Full Feasibility Study. The PEA, with a financial accuracy of 30%, will be filed as an independently approved form of a public disclosure document required by those financial regulatory markets to which Wolfden reports. The PEA will include amongst other things, much of the similar technical information included in this rezoning petition, in addition to a more detailed (estimated) mine plan, schedule and estimated costs and revenues that support the positive practicality of building an operation at Pickett

Mountain and in continuing with further exploration, technical studies and ultimately mine permitting.

Wolfden is committed to demonstrating to the mining community, its investors and all relevant stakeholders that Maine is "open for business" when it comes to employing proven safe and modern mining techniques. Rezoning, Mine Permitting and implementation of the project also would demonstrate that the LUPC and DEP rules governing metallic mineral mines are not preclusive of mining in the State of Maine.

Wolfden benefits from established strategic relationships with larger companies such as Kinross and Altius, which have the experience and capability to build a modern base metal mine in Maine. Wolfden's management also has a track record of success in building modern mines, including the financing of the largest producing mine in Burkina Faso, West Africa (Essakane Mine) that even more than ten years later is still the single largest contributor to the GDP of the country. Wolfden urges that the Commission not focus on its balance sheet of today and a project financing to build the project will not be pursued by any mining company, large or small, until the completion of a full feasibility study and a successful mine permitting process.

Exhibit I

Corporate Good Standing

Exhibit J

Soil Suitability and Mapping

Attachment G provides available low intensity soil maps. The soils present are derived from glacial till deposited over bedrock. On-site mapping of soils has not been conducted but based on available information soils are generally suitable for the proposed project for construction of facilities and the TMF. Geotechnical investigations are scheduled in the summer of 2020 for determination of geotechnical characteristics of soils for design of building foundations, the TMF, and completing stability analyses required by DEP's Chapter 200 rules. Hydrogeologic characterization will also be required to design monitoring systems, determine an appropriate location for a domestic wastewater septic field, and to design and size the infiltration galleries for re-injection of treated water back to groundwater. These studies will be detailed in nature and implemented as part of the baseline and background studies to support detailed design of the above ground mine facilities.

Exhibit K

Wastewater Disposal

The location for a wastewater disposal system using a septic field will be determined based on field investigations conducted for the baseline characterization pursuant to MEDEP Chapter 200 regulations. The disposal system will be designed during the DEP permitting phase of the project.

~~Exhibit L~~
~~Impacts on Public Services~~

~~See discussions provided in Appendix A — Attachment O.~~

Exhibit M
Archaeological Resources

Exhibit N

~~4.1.11.1.1~~ Rare or Special Plant Communities and Wildlife Habitat

Appendix A

Chapter 12 Requirements

Mining and Level C Mineral Exploration Activities

B. Criteria for Approval of a Petition to Change a Subdistrict to a D-PD Development Subdistrict for Metallic Mineral Mining and Level C Mineral Exploration Activities.

This Section of the Petition is responsive specifically to Chapter 12 § 4.B.(3) of the LUPC rules.

The factors listed in Chapter 12 § 4.B.(2) are addressed in corresponding Attachments to this Petition.

B(3)(a) Potential Short- and Long-Term Socioeconomic Impacts

Description of Cost Modelling:

In order to estimate the economic impact that could result from a project such as Pickett Mountain, Wolfden first constructed an overall cost estimate and economic forecast of the entire project (Cashflow Model). This model was constructed using a series of first principles calculations, to develop the underlying basis for cost and revenue streams as well as comparative studies in order to estimate unit costs for each aspect of the project. Costs are broken down into several silos. These silos include:

- ~~Capital Infrastructure/Construction~~
- ~~Mining Costs~~
 - ~~Milling Costs~~
 - ~~Environmental Costs~~
 - ~~General & Administration Costs~~
 - ~~Energy Costs~~
 - ~~Maintenance Costs~~

~~Capital Infrastructure/Construction are a series of estimated project costs scheduled into the model. This is inclusive of building costs, earthworks, civil works, any infrastructure required as well as upfront permitting expenses, exploration projects, and design engineering prior to starting construction of the project.~~

~~Mining costs are built mainly from first principles then compared to other project costs to evaluate accuracy. These costs include the cost of development, production, vertical development and diamond drilling work. In addition, these costs cover engineering support and mine management.~~

~~Milling costs include all reagents, manpower, tailings management, assay lab and related activities, and crushing costs (Contracted or with owned equipment).~~

~~Environmental costs include equipment, related to environmental activities, lab consumables, manpower, the water treatment facility, any spill clean-up costs, environmental consulting fees, ongoing permitting fees and any licensing fees related to environmental projects.~~

General and Administrative (G&A) costs include Administration manpower, training, education and professional development costs, software licenses, insurances, general office supplies, communications costs, general site maintenance (Snow removal, road work, etc..) and freight costs.

Energy costs include diesel consumptions, gasoline used on site, propane and electrical power consumption.

Maintenance costs include maintenance on mobile equipment used in the mine, mill and on surface and fixed building maintenance for all infrastructure onsite, as well as components within them. Maintenance is sometimes contracted based on specialty requirements.

After each of the cost silos were constructed, the costs were then compiled to each of their specific project phases (Permitting, construction, operations and reclamation) and distributed by the following when applicable:

- Employment
- Consumables
- Services
- Energy

By organizing costs in this fashion, Wolfden can anticipate the distribution of costs, by project phase and schedule, that would be spent within the local communities, the impacted counties, the state and the country. The result are summarized in the following tables. A copy of the economic model is submitted with this petition.

Cost Tables Here

In total, the anticipated investment within each of these impact jurisdictions (community, county, state and country) over each of the four project phases (permitting, construction, operations and reclamation), is as follows:

- Total estimated investment into the local communities over Life of Project (LoP) duration is \$164.5 million.
- Total estimated investment into the impacted counties over the LoP is \$230.6 million.
- Total estimated investment into the state of Maine over the LoP is \$413.4 million.
- Total estimated investment into the United States of America over the LoP is \$477.8 million.

Not included in the economic benefits calculated above, is the potential continued future income from trained employees who elect to travel abroad for work post operation of Pickett Mountain. In the mining industry, traveling employment (Fly In, Fly Out) or camp style jobs have become standard. Travel and work schedules range and vary significantly depending on the project, however, these types of jobs are structured to support skilled and trained workers who enjoy working in the mining industry but do not want to relocate away from their home: in this case, Maine. Mining companies commonly support employees through this type of creative and flexible employment model due to the nature of mining in distant and remote areas where mineral deposits are located far from population centers.

Assuming 50% of the total ~60 employees trained and hired at Pickett Mountain remain within the industry for the remainder of their careers (~14 years), this could potentially result in additional income of \$44.4 million. This does not consider future generations that take an interest in this industry. This type of operation can be seen all over the world and some North American examples are as follows:

Mine	Company	Location	Schedule	Shift Duration	Total Employees
Meliadine Mine	Agnico Eagle	Nunavut, Canada	2 weeks in 2 weeks out	12 hours on and 12 hours off	~800
Schefferville	Tata Steel Minerals	Labrador, Canada	2 weeks in 2 weeks out	12 hours on and 12 hours off	~250
Mussel White	Newmont	Thunderbay, Canada	2 weeks in 2 weeks out	12 hours on and 12 hours off	~600
Red Dog	Teck Resources Limited	Alaska, USA	4 weeks in 2 weeks out	12 hours on and 12 hours off	~460

Employment:

Exploration/Permitting Phase

The levels of employment, aggregate wages and other direct expenses during the exploration and permitting phase is typically small compared to the overall project and are filled via contract/short term hires. The scope of professional services during this phase is designed to communicate with public and state stakeholders, produce communications and application submittals as well as address any comments or questions that arise throughout the permitting process. Within this phase of the project, it is typical that a series of test work is completed which include:

- Environmental baseline characterization work
- Engineering studies (health and safety, environmental management, geotechnical metallurgical, mining, financial)
- Infrastructure evaluations
- Workforce evaluations
- Detailed sequencing and scheduling

Concurrent with permitting activities, it is customary to continue conducting exploration activities to improve the knowledge of the current deposit as well as to expand known or inferred mineral resources.

Environmental baseline characterization work will be performed through the support of consultants sourced within Maine since the skillsets required for this work exist within the state. The work will be a combination of field work, desk top studies, data analysis and reporting. Typical unburdened wages for these employees are between 40-45\$/hr as an average of experience and skillsets. Exploration positions such as geologists, drillers and drill helpers that take place at the site are typically done with similar employee rates (40-45\$/hr) as an average across skillsets and experience. These employees oversee drilling core and other geological samples as well as logging and mapping the rocks as well as identifying resources which are then converted to potential mining areas. Employment during this phase is typically specialized and imported from larger cities. Employees supporting the property during this phase would typically stay in rented homes, apartments or hotels. Since this phase is has minimal employment, the surrounding infrastructure would not be impacted by addition to the population.

As the project becomes permitted and transitions into construction phase, Wolfden would target a transition to permanent hires for some of these technical positions. Skillsets that are based in Maine (environmental, civil & infrastructure, construction planning) would be sourced locally. Specialty skillsets such as mining and specific metallurgy will likely be outsourced to support project success. Within this phase of the project, communications with local post-secondary schools to guide interest in establishing a program to target specialty skillsets in order to replace non-local workforce with local workforce in subsequent phases of the project. These types of programs will consist of both field and classroom learning and will target the next generation demographics. These types of programs have been very successful in other jurisdictions with high level of employment post-graduation, not only in the target project but projects abroad as this industry has a high rate of travelling workers and professionals. This type of program has worked well in various mining camps including neighboring New Brunswick, Canada which initially focused on First Nations employees. A synopsis of the short education campaign performed in New Brunswick is as follows:

- Ran three First Nation mining courses through the New Brunswick Community College (NBCC) in Miramichi and Bathurst NB

- 26 People were trained for underground miners course
- 12 people were trained for mill operators course
- 14 People are still employed underground at the Caribou Mine in New Brunswick
- 2 Mill operators are still employed at the concentrator and are proceeding through the ranks
- Several trained miners have transitioned to working at different mines via relocation or fly in fly out
- Courses were difficult to fill as they were restricted to First Nation members. Majority of the First Nation communities are greater than an hour drive from the mine site.

Based on the conceptual project economics, the anticipated spend / investment on manpower for exploration and permitting phase of the project is ~\$1.4 million.

Construction Phase

The construction phase of the project is anticipated to last one year in duration. During the construction phase, significant civil projects are required to take place as described above. As designs will likely be completed within the permitting phase of the project, most of the workforce during this period will be engineering, procurement and construction management (EPCM), project management, and labor workforce. Typically, labor includes heavy equipment operators, concrete and civil works, logging, steel and timber construction work, millwrighting, surveying, logistics coordination etc. The amount of workforce expected during this phase is extremely variable and will be sourced significantly through contractors as majority of the skillsets required are short term. Throughout the construction phase, the manpower working onsite can range anywhere between 10 to 50 people working at any given time depending on the construction projects currently on going and at what stage they are. Majority of the workforce for this phase of the project will be contracted due to short duration, and majority of the contractors hired can potentially be sourced locally depending on skillsets available as the tasks involved are not specialized for a significant portion of the construction phase. Specialty work that is required during the mining initiation as well as construction of the concentrator will likely be sourced externally.

Based on the conceptual project economics, the anticipated spend / investment on manpower for the construction phase of the project is ~\$49.9 million. Employment during this phase is typically specialized and imported from larger cities. Employees supporting the property during this phase would typically stay in rented homes, apartments or hotels. Since this phase has the most significant employment, additional residence would be required to stay in nearby larger towns. It is reasonable in this type of industry to commute for over an hour to a place of work. Therefore, the infrastructure from a larger radius would be able to support additional requirement.

Operating Phase

The operating phase of the project is anticipated to last for roughly 10 years which has potential to extend longer provided positive results from diamond drilling exploration throughout the mine life.

With steady state operations, comes significant opportunity to train and employ significant local workforce. As described above, it is Wolfden's strategy to establish a training program through a local college in order to facilitate organized education of the next generation of miners and mill operators within the region. While being able to offer on the job training opportunities that lead to full time employment pending posting availability and employee performance. This is extremely valuable to Wolfden, as it provides the availability of a labour "pool". Having this source of local employees helps ensure steady operation of the mine and mill complex. Shifts in both the concentrator and in the mine will be 12 hours long with two shifts per day to cover the 24/7 operation. Schedules will typically be 1 week of work on and 1 week of work off. This allows employees significant rest opportunity as well as maintains similar annual cumulative hours to a standard 40-hour work week. It is very typical that employees working this schedule are able to commute over an hour away from the project site. Therefore, the requirement to move to a closure community is not necessarily required.

The roles within the Operating phase of the project include but are not limited to the following:

Mine

- Equipment operators (scoops and trucks)
- Jumbo drillers
- Long hole drillers
- Blasters
- Nippers (materials and supply delivery and retrieval)
- Grader operators
- Ground support miners

Concentrator

- Crusher operators
- Grinding operators
- Flotation operators
- Reagent mix operators
- Dewatering operators
- Tailings operators
- Concentrator loadout

Ancillary

- Health and Safety

- Mechanics
- Electricians
- General Construction/Maintenance
- Civil works
- Road grading and snow removal
- Purchasing and procurement
- Accounting
- Human resources
- Security
- Supervision/Management
- Water treatment facility operators

Technical

- Mine Engineering
- Geology
- Ventilation
- Geotechnical
- Survey
- Environmental Engineering
- Planning
- IT

Based on the conceptual project economics, the anticipated spend / investment on manpower for the construction phase of the project is ~\$99.5M USD.

Reclamation Phase

The majority of the reclamation work would occur during the operation phase, as well as early in the reclamation phase. It is Wolfden's priority to ensure that the project is significantly de-risked at all stages of the operation. The tailings management facility (TMF) will be constructed using a staged approach.

A detailed description of the reclamation phase is discussed later in this Petition. With regard to workforce, the skillsets required for this phase of the project life will once again be short term and somewhat specialized. For that reason, it is anticipated that much of this decommissioning work will be contracted to Maine based specialists. In addition, operators to finalize closure of the TMF will be kept on as well as water treatment facility operators to continue treating and discharging water. The environmental team will be the last to remain on the site, ensuring that all discharge guidelines are being met as well as evaluate the site contact water to ensure that it is returning back to background per design.

Based on the conceptual project economics, the anticipated spend / investment on manpower for the construction phase of the project is ~\$12.4 million.

Consumables:

Materials supplies and consumables at each stage of the project vary significantly by type and volume. Majority of the consumables will be purchased within the construction and operation phase of the project and locally sources when applicable, however, a significant portion (~50%) of this spend will be sourced external to Maine due to the nature of the supply. The estimated spend / investment on materials, supplies and consumables is as follows by project phase:

Construction — \$99.9 million

Operation — \$95.3 million

Reclamation — \$5.0 million

Services

Services required by the project phases are support provided by contractors and consultants etc. These are typically used for short term or specialized projects throughout the life of the project. These costs are also inclusive of payments to the government agencies of Maine in order to facilitate review and management of any permits required for this project. It is not anticipated that majority of these skillsets will be sourced locally. However, within Maine and other states, significant support for these services are anticipated to be found.

The estimated spend / investment on services by project phase is as follows:

Permitting/Exploration — \$1.1 million

Construction — \$8.3 million

Operation — \$66.4 million

Reclamation — \$4.9 million

Energy

Energy costs related to Pickett Mountain are mainly supplied from within Maine. Energy includes costs such as electricity, diesel fuel, propane and gasoline to run through each phase of the project life. The estimated spend / investment on energy by project phase is as follows:

Permitting/Exploration — \$0.0 million

Construction — \$8.3 million

Operation — \$82.6 million

Reclamation — \$2.5 million

~~B(3)(b) Potential Impacts on Services~~

~~Attachment O contains an evaluation of the potential impacts on services (including fire and police protection, education and solid waste disposal) and utilities. The evaluation identifies the proximity or availability of those services and utilities, and potential burdens for communities or State, county or local governments to provide those services if burdened. Attachment O is titled *Evaluation of Sufficiency of Existing Services and Utilities, and General Measures to Increase Service Capacities (if required) including Burdens on Communities or Government to Provide Those Services*. The evaluation describes the demographics of the labor market (principally the Houlton Labor Market Area), the housing market, education infrastructure and public safety services and discusses the expected geographic relationship between these services and where Wolfden anticipates the needed 60 person work force might come from locally (i.e., which towns and communities) as these new jobs are created for mine construction, operation and closure.~~

~~This evaluation suggests the proposed mine and job creation will have a positive local effect of housing, and the job market in general but is unlikely to pose an undue burden on other services provided at the community and state levels. The largest burden is likely to be the introduction of some new students into the regional school system, but whether this represents a burden or not depends on the capacity of the individual public school to support additional students, if their parents move into a school district in response to employment at the mine. Attachment O contains a letter from the Stacyville school district (Regional School Unit 89) indicating that expected enrollment of additional students within that RSU would not be a burden.~~

~~B(3)(c) Potential Impacts on Existing Infrastructure~~

~~The two primary infrastructure systems that could be affected by the project include power and roads. The project will not require public water or public waste water disposal.~~

~~**Attachment J** provides a map and description of existing transportation infrastructure routes, and an analysis of potential impacts and improvements. Access to the site is through well developed and well maintained private gravel roads, currently used for logging. These private roads connect to a series of State highway routes and eventually the interstate system. These routes will be used for travel of employees to work and for transportation of mineral concentrates to market for smelting in Canada. The additional traffic volume and capacity of this road system does not burden the infrastructure.~~

A new power transmission line will be installed by Emera Maine from their substation located south of Patten Maine on Route 11. The new power line will follow Route 11 for 9.5 miles then the existing gravel access road for another 5.1 miles. Wolfden will contract with Emera directly for this service.

B(3)(d) Potential Impacts to Existing Uses and Natural Resources

Introduction

The following subsections present an assessment of potential for impacts to natural resources including forest resources; historic sites; wildlife and plant habitats; scenic resources; water resources; and recreation resources.

A significant component of this discussion is dedicated to surface waters (ponds and streams) and groundwater since these are the resources most vulnerable during the development, operation and closure of the Pickett Mountain mineral deposit. This evaluation discusses the nature of the water resources including the relationships between topography, location of groundwater divides, areas of groundwater recharge and groundwater discharge. An initial estimate of an overall hydrologic water balance for the site is also provided.

The mine development, operation and closure strategy is predicated on protecting these water related resources. Therefore, a discussion of this overarching strategy is presented after discussion of the resources and addresses how these resources will be protected.

This information is followed by a general discussion of the Pickett Mountain mine development, operation and closure strategy and the management of mine-related waters. Those approaches, as well as the physical setting of the mineral deposit provide the means for mitigation of potential impacts to water resources.

Surface Water Resources and Groundwater

The following sections describe the physical setting, surface water, groundwater hydrogeology and groundwater resources.

Physical Setting and Surface Water Resources

The Pickett Mountain Deposit is situated beneath a portion of an approximate 2.7 mile long ridge with moderate elevations ranging from 1,360 to 1,140 feet (west to east). The ridge is bordered to the south by Pickett Mountain Pond, to the east by Tote Road Pond and Grass Pond, and to the north by Pleasant Lake and Mud Lake. Pickett Mountain Pond flows through an unnamed stream to Grass Pond and hence north to Mud Lake and the West Branch of the Mattawamkeag River. Pleasant Pond flows easterly to Mud Lake. Tote Road Pond outlets to a stream that flows easterly to Hale Pond and hence northerly through Green Pond to an unnamed stream that also joins the West Branch of the Mattawamkeag River.

The various lakes and ponds have the approximate following acreages:

- Pickett Pond — 173 acres

Grass Pond ————— 42 acres

● ————— Pleasant Lake — 310 acres

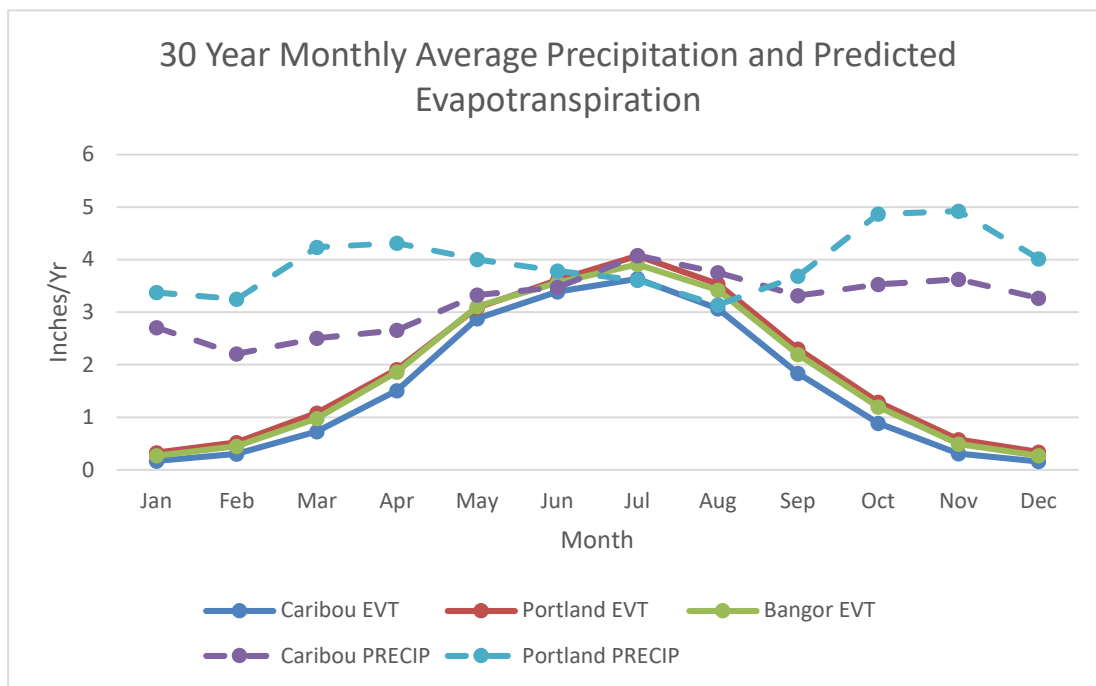
Mud Lake ————— 188 acres

Tote Road Pond — 28 acres.

The ridge occupying the Pickett Mountain Deposit is bordered by higher elevations to the south including Mount Chase, Long Mountain and Pickett Mountain and to the north by Hay Brook Mountain, Roberts Mountain and Green Mountain. Another intervening ridge of similar elevation is present north of the West Branch of the Mattawamkeag River, where it enters the west side of Pleasant Lake. Surface water drainage and shallow groundwater discharge from the southern slope of this intervening ridge and Green Mountain contribute groundwater and surface water flows along the north side of both Pleasant and Mud Lakes. Prior field observations including surface water temperature measurements indicate the presence of groundwater seeps that flow into Pickett Mountain Pond and the stream flowing from it. Long and Pickett Mountain to the south, also contribute to groundwater and surface water inflows to Pickett Mountain Pond.

Groundwater Hydrogeology

Based on subsurface drilling conducted during mineral exploration activities, the site is characterized by relatively thin glacial deposits which mantle bedrock with moderate to steep slopes. Within margins of intervening valleys stratified glacial deposits are potentially present. Groundwater and surface water divides are expected to be controlled by topography and groundwater flow direction should mimic topography. **Attachment I** provides a depiction of the anticipated groundwater and surface water divides, and indicates anticipated groundwater flow directions. Based on studies of similar geologic and geographic settings (Gerber and Hebson, 1996) and historically averaged precipitation data (<http://www.nrcc.cornell.edu/wxstation/pet/pet.html>), the site is anticipated to receive approximately 45 inches of total annual precipitation (see figure below). Recharge to groundwater (Net precipitation minus evapotranspiration) will result in overburden groundwater and shallow bedrock groundwater recharge and groundwater flow toward surface water bodies including lakes, ponds and streams.



Average Precipitation and Evapotranspiration Rates Across Maine

The majority of shallow groundwater recharge is in spring and fall when temperatures are above freezing and evapotranspiration rates are lowest, and precipitation highest as depicted in Exhibit 1. The majority of recharge will be too shallow (possibly perched) and deeper overburden groundwater with a smaller amount of recharge to bedrock groundwater, typically in the range of 2-10% (Gerber and Hebson, 1996). The amount of recharge typically increases toward the top of the topographic highs due to increased vertical gradients, with lower recharge rates down slope toward groundwater discharge areas. This shallow groundwater will form the base flow of groundwater recharge to surface water.

The hydraulic conductivity of silty glacial tills is typically low (< 1 feet/day). Therefore, the movement of overburden groundwater at the site is expected to be slow (< 0.2 feet/day) given anticipated hydraulic gradients, which should approximate the slope of the hill slope from the site to Pickett Mountain Pond (0.05 feet/feet). The slow groundwater migration rates and large distances to surface water bodies from the site (3,500 feet to Pickett Pond and 6,500 feet to Pleasant Lake afford a high degree of protection to surface water resources.

4.1.21.1.1 Significant Sand and Gravel Deposits

A surficial deposit with good to moderate potential yields is mapped along the northern side of portions of Pleasant and Mud Lakes (**Attachment I**). Based on topography and subsurface drainage basin boundaries indicated on the Significant Sand and Gravel Aquifers Map of the Green Mountain Quadrangle (MGS Open File No. 01-75-2001) surface water divides are generally coincident with groundwater divides. This significant sand and gravel deposit therefore does not receive recharge or run-off from site (i.e., the north facing portion of the ridge that contains the Pickett Mountain Deposit) and would not be affected by the proposed project.

Hydrologic Water Budget – Overburden and Bedrock Groundwater Resources (

A divide in surface water and groundwater occurs along the ridge separating surface water and groundwater flow to Pickett Mountain Pond and Pleasant Lake (**Attachment I**). The drainage sub-basin occupied by this portion of the ridge occupies approximately 3,330 acres (830 acres south of the divide and 2500 acres north of the divide). On average it is expected that 42% of precipitation is lost to evapotranspiration and run-off, with the remaining water budget resulting in recharge to overburden and bedrock groundwater (Gerber and Hebson, 1996). Approximately 5% of precipitation is assumed to be to bedrock. This results in the following estimated water balance for the sub-basin provided in the following table. Most of the overburden groundwater would be expected to discharge locally within the local drainage basin (>95%), with the exclusion of recharge to bedrock. Some shallow bedrock groundwater would also be expected to discharge locally to streams in upland mountain areas and deeper sections of ponds, where present.

Estimated Hydrologic Budget

Area	Size (acres)	Net Precipitation (acre/feet/yr)	Evapotranspiration (acre/feet/yr)	Overburden Recharge (acre/feet/yr)	Bedrock Recharge (acre/feet/yr)	Overburden Recharge gallons/year	Bedrock Recharge gallons/year
Total Sub-Basin	3330	12488	5245	6881	362	2,242,201,434	118,010,602
North of Divide	2500	9375	3938	5166	272	1,683,334,410	88,596,548
South of Divide	830	3113	1307	1715	90	558,867,024	29,414,054
Developed Mine Area	20	75	0	-37	-3	(11,975,809)	(1,099,819)
Percent Excluded During Mine Operation	0.6%	0%	0%	1%	1%	1%	1%

Total Annual Precipitation	45
Interception	2
Net Annual Precipitation	43 inches
Bedrock Net Recharge	5 %
EVT Rate & Run-off	0.42 %

Developed Mine Area = area where precipitation/ runoff is collected for treatment.

Assumes 15 Acres of the Total Tailings Area open at at given time

The total area of land disturbance for mine development (excluding roads) is approximately 106 acres and includes the footprint of buildings, mine portal, a surface water management facility and a dry TMF (approximately 78 acres). Precipitation over much of this area (approximately 92 acres) will be managed to control run-off of non-contact waters, and water that potentially contact waste materials including waste rock and exposed tailings in the TMF (approximately 20 acres at any given time). Collected waters will be treated as discussed later in this section.

The area of mine development during operations is intentionally limited in size. When the water budget within this area is compared to the drainage basin, it becomes clear that impacts to

recharge of groundwater (overburden and bedrock) and run-off of surface water to surface water bodies is negligible, and as a percentage (<1%) is within the range of annual variations in precipitation. Even if average annual precipitation varied by as much as 10% (+/- 5 inches), the percent reduction in recharge remains essentially the same. The immediate reduction in recharge is replaced by re-infiltration of clear treated effluent from the water management system (which is reflected in the table above).

Forest Resources

Wolfden currently owns 7,148 acres located in the southeastern corner of Township 6, Range 6 (T6R6). The property is entirely undeveloped and forested, except for six privately owned camps (seasonal residences) and logging/woods roads. The property has generated approximately \$300,000 in revenue annually from timber revenue. The Company entered into a timber harvest agreement in January 2020 to sell \$5 million of its timber over the next five years to a local timber company. Much of these proceeds will be used to advance the project. The timber industry is the primary industry in the area and is the driver of the local economy. The area proposed for rezoning is approximately 528.2 acres which includes approximately 106 acres of land that would be constructed upon or disturbed by construction. The mine is planned to operate for 10 years after which the impacted area would be restored. The mine operations area would be restored as forest and would eventually again be logged/harvested. The dry stacked tailings pile would be capped and restored/revegetated. The cap concepts will be developed during the final design. The cap is required to achieve the same permeability as the liner system. Several concepts will be evaluated from a dry cap that promotes run-off in a course armored infiltration layer that would discourage large tree growth and protect the underlying low permeability barrier from root damage and wind throw, to a wet cap that mimics local hydrology and is able to sustain a wetland like condition where large tree growth is naturally discouraged. Other alternatives include long term management of vegetative growth on the cap, similar to a conventional landfill cap. There would be no restrictions on current and future timber operations on the remaining 6616.8 acres of the property while the mine is in operation and being restored. The development associated with the proposed mine would affect less than 1.3% of the property currently in forest production. Therefore, impacts to the forest resources and timber industry would be negligible.

4.1.31.1.1 Wetland Resources

The U.S. Fish and Wildlife Service has mapped wetlands in T6R6 as a part of the National Wetland Inventory (NWI). The NWI mapped wetlands have been promulgated into LUPC Land Use Guidance Maps. There are NWI mapped wetlands on the property. The mapped wetlands are primarily palustrine forested and palustrine scrub/shrub wetlands, associated with Pleasant Lake and Pickett Mountain Pond. In addition, the West Branch of the Mattawamkeag River flows across the south part of the property. There are no NWI mapped wetlands in the area of the proposed mine development, however due to the scale of NWI mapping, it can't be concluded that there are no wetlands on the site.

A reconnaissance of the area proposed for development was conducted in October 2019. The purpose of this reconnaissance was to preliminarily identify wetland resources including wetlands and potential vernal pools, and the possible presence of small or intermittent streams. During the reconnaissance wetlands, potential vernal pools, and intermittent streams were observed. The results of the reconnaissance suggest that a detailed wetland and vernal pool survey of the proposed development area during the growing season was warranted.

In spring of 2020 a detailed delineation and reconnaissance level evaluation of wetlands and vernal pools was conducted. The report on these wetland and stream features is appended to Exhibit D-1, existing site plan and conditions. Exhibit D-2 presents the proposed site plan and shows how the proposed development can occur with no impacts to vernal pools, wetlands and streams and observing a 75 foot buffer on all such natural resources.

It is Wolfden's aim to conserve and protect the wetlands and their ecological functions by avoiding impacts to the extent practical, minimizing impacts where they cannot be avoided, and compensating impacts that are not avoidable. The current development plan achieves these goals with no impact.

At the completion of the mining project, the site will be reclaimed removing all buildings and structures except the TMF. The final grading plan for this final phase of the project can be designed in a manner to enhance and create forested wetlands and associated vernal pool habitats in areas with appropriate hydrology within the footprint of the mine operational area.

Based on our current understanding of wetlands present at the site, the project will meet the goal of protecting the ecological functions of wetland resources, including vernal pools.

Correspondence with the Maine Department of Inland Fisheries and Wildlife is presented in Exhibit N.

Other Water Resources (surface water, streams, shallow groundwater)

The property includes lakes, ponds, and streams, including Pleasant Lake, Pickett Mountain Pond, Mud Pond, west branch of the Mattawamkeag River. The area proposed for development however does not include any mapped streams or surface water bodies based on the USGS topographic map (i.e., Green Mountain, Maine). Although there are no USGS mapped streams within the area proposed for development, the area may include intermittent streams, too small to be picked up at the scale of the USGS maps. As noted in the Wetlands section, intermittent streams and shallow groundwater were observed during the October 2019 and have been delineated. Impacts to water resources would be avoided to the extent practicable and any impacts would be mitigated through restoration activities. In general impacts to water resources would be negligible based on the proposed treatment and discharge of water generated during mine operations, as discussed in the preceding sections. The water generated by mine operations will be treated and released back into the environment following all rules and best management practices and achieving requirements specific by the MEDEP Chapter 200 regulations.

Wildlife Resources and Habitats

The property contains a mix of terrestrial and aquatic habitats, including forested uplands, forested and scrub shrub wetlands, rivers, streams, ponds and lakes. The majority of the

property is forested composed of a mix of deciduous and evergreen trees. Wildlife common to the Northwoods include deer, moose, bobcats, fishers, as well as a number of small mammal species. Avian species including passerine birds, accipiters and hawks, and piscivorous birds such as kingfishers and herons are also common, as are waterfowl including ducks, geese, and loons. The area proposed for development is primarily upland forested habitat, co-dominated by deciduous trees (i.e., beech, birch, and red maple trees) and coniferous trees (i.e., spruce, fir, cedar and hemlock). The area has been logged in the past and is currently in re-growth. Evidence of past logging operations in the form of skidder trails and logging roads are common throughout the area proposed for rezoning and development. The forest understory is relatively open and lacks dense growth commonly found in recently cut forest. Wildlife are accustomed to logging activities in the Northwoods and based on the current mine plan the mine operation would have less impacts to wildlife than common logging operations.

Correspondence was sent to the Inland Fish and Wildlife Service (November 6, 2019) to obtain a list of Rare, Threatened, or Endangered species that could potentially be found in the area. The IF&W provided a preliminary response to this request on November 25, 2019 which indicated there were no known occurrences of endangered, threatened or special concern species within the project area (Exhibit N). The IF&W also has not mapped any significant wildlife habitats within the project area. The IF&W did identify Great Blue Heron colonies as species of concern and noted the special protection afforded to eight species of bats and concern for habitat protection. The preliminary screening survey conducted to date did not identify habitat that would support Great Blue Heron colonies or bats, the latter due principally to very limited and small exposures of bedrock outcrop and lack of talus slopes. A detailed assessment of terrestrial fauna will be completed under baseline studies required by MEDEP Chapter 200 regulations, encompassing a survey of the area proposed for development individual species and or suitable habitat for the species identified. Impacts to rare, threatened or endangered wildlife are not known or expected and if identified will be avoided and minimized.

Plant Habitats

The area proposed for development includes upland forested habitat and as noted has been logged in the past. The forest habitat includes a relatively open understory dominated by saplings of the dominant tree species. Shrubs are also present in the forested. The herbaceous growth in the forest habitat includes moss, ferns, grasses, and sedges.

Correspondence with the MNAP was submitted to request a list of known or suspect rare, threatened or endangered plants occurring in the area. Exhibit N contains the MNAP response which indicates that there are no rare botanical features documented specifically within the project area. Impacts to rare, threatened or endangered plants are therefore unlikely but if such botanical features are identified they will be avoided and minimized. Unavoidable impacts will be mitigated through moving/transplanting rare, threatened or endangered species when impacts are unavoidable. Consistent with MNAP recommendations, a detailed assessment of terrestrial flora will be completed under as part of the baseline studies required by MEDEP Chapter 200 regulations. Based on discussions on MNAP correspondence lakeside graminoid/shrub fen is

located between Pleasant and Mud Lakes. These would not be affected by proposed activities and are outside the area to be re-zoned. in support of the MDEP mining permit application.

Historical Sites

The Maine State Historic Preservation Office has been consulted to identify any known or suspected historical sites on the property. A stone tool archeological habitation site is known near the headwater of Pickett Pond. The Phase 0 Assessment included background research and a field inspection. Background research considered various 19th and 20th century maps of the area, contemporary topographic and bedrock/ surficial geological maps, and review of MHPC site files associated with previously identified site 147.001. These resources confirmed the potential presence of toolstone geological resources within the project area, possibly including chert and fine-grained volcanics. The field inspection was conducted by NE ARC Assistant Director Dr. Gemma Hudgell

Background research and field inspection indicates that the project area contains three areas of outcropping "cherty rhyolite", which is a knappable lithic material of a type known to have been used by Native Americans to make stone tools. The artifacts from the nearby previously identified Native American site, 147.001, may be of this material, or a very similar type. The project also possesses archaeological sensitivity for Native American archaeological habitation sites based on the presence of a fairly level till bench terrace located above Pickett Mountain Pond in the southeastern portion of the project, and given the identification of site 147.001 within 250 m of the southern boundary of the project on a similar landform near the head of the same pond. The project area is not considered sensitive for the presence of historic period archaeological resources and a Phase 1 survey could be recommended if Wolfden continues to the next phase of background study testwork and permitting for the DEP. A memo is included with this petition and a formal detailed report is available.

4.21.1 Scenic Resources

The project has been designed to limit impacts to scenic resources. The "below ground" mine operation limits the footprint of mine requiring a relatively small area for mine operations—approximately 7 acres, dry stack tailings pile—approximately 78 acres and total clearing—approximately 137 acres. In addition, the dry stacked tailings will match base line contours, to not protrude from the surrounding topography. The overall elevation increase in the footprint of the tailings facility is expected to be a maximum of 22 feet higher than the original ground surface. Once the mine operations end the impacted area will be restored and will be allowed to reestablish as forest.

Recreational Resources

The area proposed for development does not include any snowmobile trails, hiking trails, or camping areas nor does it include any aquatic resources suitable for fishing. The area proposed for rezoning makes up only 1.3% of the total property. It is unlikely that the proposed mine would impact recreation resources. Once the mine is closed there would be no impacts to recreational resources.

Mine Development, Operation and Closure Strategy

The following section provides a general overview of how mine and process waters will be managed. The strategy for mine development, processing of mineralized rock, and management of tailings is discussed. Each of these processes have a water management component. Additional Information is provided in **Appendix M**

Overview – Management of Mine Waters, Process Waters and Septic Waters

Proper planning, management and treatment of site impacted waters can avert impacts to natural water resources including groundwater, run-off, and surface water. Elements of water management designed to alleviate the potential for adverse impacts are described in the following subsections.

Development of the Pickett Mountain mineral deposit will require collection of groundwater seepage for subsurface dewatering during underground mining operations and collection of surface water runoff from within the footprint of the developed property. These waters will be used in the beneficiation of the economically valuable minerals which includes milling and flotation to separate valuable from non-valuable minerals and create a concentrate that will be shipped off-site for further refinement (smelting) as well as tailings that will be stored on a lined tailings facility located onsite. Waters impacted by these processes will be treated and re-used to the maximum extent possible. It will be the intention of the concentrator/tailings design to have a net negative water balance that will require makeup water.

Water from the mine (seepage and process water) will be collected and treated to within water discharge guidelines and rules that include at or better than background quality. A portion of the treated water will be reused at mining process water and concentrator process water make up. Sewage from the mine will be contained to Portable Toilets (Porta Potties). These will be on contract basis and managed through replacement of filled facilities with clean facilities by the supplier. Sewage from all surface structures will drain to a septic system located on the site down gradient of the building infrastructure and potable water supply. Any excess treated water will be returned to the environment as recharge via system of underground diffusers, similar to a septic system leach field. Water from the tailings facility will be managed

separately. As a result of the water management strategy and the water balance required to sustainably operate the mine, impacts to water resources are expected to be negligible.

The estimated water balance from the milling/tailings facility is as follows resulting in a process water make up requirement of 68.4 cubic meters per day or 12.3 USGPM.

Overall Water Balance				
Water Product	Solids		Water t/d or m ³ /d	Comments
	%	t/d		
Plant Feed (flotation feed)	30	1000	2333.3	Need per day
Cu Conc.	80	15.5	3.87	Lost in concentrate
Pb Conc.	80	10.6	2.65	Lost in concentrate
Zn Conc.	80	49.5	12.4	Lost in concentrate
Tailing	80	807.4	49.5	Lost in concentrate
Process Water Recycle	-	-	2264.88	Amount recovered
Need Process water	-	-	68.42	

Mine Development Strategy

The strategy for mine development is to conduct underground mining using a long-hole stoping method with a decline, to allow underground haulage trucks to carry mineralize rock (mill feed) to a surface staging pad, where waste rock will be segregated from Mineralize Rock. Waste rock would be staged until it can be returned underground for backfill. Waste rock that is placed underground as backfill is not treated or neutralized, rather is simply placed as broken rock. Typically, waste rock outside of the Pickett Mountain deposit is non acid generating and in fact carries significant neutralizing potential. In addition, after waste rock is deposited underground, it is in a low oxygen environment and therefore will not react with ground water if portions of the rock do contain acid generating potential. Seepage of bedrock water as well as injection of mine process water into the underground workings, necessitates a program of mine dewatering. Although engineering/hydrologic studies have not been conducted to quantify flow rates required to keep the working areas of the mine in a dewatered state, it is currently estimated based on similar site experience and the likelihood of low transmissivity bedrock at depth, that these "seepage" flows are likely to be on the order of 30 gallons per minute (gpm) long term.

Initial dewatering is usually conducted through use of bedrock extraction wells (dewatering wells) to reduce the bedrock potentiometric surface prior to and during development of the decline. This water will be used for storage and recycled for underground diamond drilling for blastholes. As underground workings are advanced, and seepage into these openings will occur, and that seepage will be pumped out eventually replacing the dewatering wells and establishing a network of water conveyance pipes within the developing mine infrastructure. During mine operation, seepage waters will continue to be collected underground through a series of temporary sumps and pumps and treated at the water management facility prior to being re-used for underground process water with excess discharged to the environment. Waters used underground for drilling and wetting down rock surfaces to eliminate dust when mucking rock out will be pumped through a connected network of pipes that can be modified and extended as the underground workings are developed.

When sulfide mineralized rock is mined and processed, the surface area of exposed sulfides increases along with the potential for acid generation. Exposure of these sulfide minerals to oxygen and water results in weathering and oxidation producing acidity (hydrogen ions),

dissolved sulfate, dissolved metals and soluble acid sulfate minerals. Undisturbed sulfide mineral deposits have limited exposed surfaces, and therefore pose little threat to groundwater under natural, oxygen limited conditions. Since this weathering process requires presence of both oxygen and water, as well as time, effective strategies to prevent acid generation are incorporated into the design and operation of the mine. In the short term, these strategies rely on limiting exposure of these materials to water in the presence of oxygen as well as water collection and treatment. In the long term, strategies rely on isolating materials from water (infiltration), intrusion of atmospheric oxygen.

The waste rock will be mined separately and segregated from the mill feed, temporarily staged and then returned underground as backfill on an on-going basis. This manages and mitigates potential leaching and environmental release of metals from this waste rock material.

Mineralized Rock Milling and Flotation Strategy

Mineralized Rock (mill feed) will be crushed on-site and finely ground to a powder utilizing a comminution (Grinding) circuit. The finely ground rock is the feed stock for the flotation circuits, where the valuable sulfide minerals (Zn, Cu, Pb, and associated precious metals Au and Ag) are sequentially segregated from gangue minerals of no economic value and into a series of Copper, Lead and Zinc concentrates. This flotation process is done with a series of chemicals and reagents that are used to treat the minerals to optimize recoveries. Chemicals that are used within the process typically remain in the process water and are broken down over time. However, since majority of the water is reclaimed into the process, this material is reused. Any potential waste chemicals or spills are collected and pumped to the tailings facility. These are then broken down over time or gathered through precipitation and ultimately gathered back into the process. Any stored chemicals that are expired or unusable for other reasons are repackaged and shipped back to the supplier or to a qualified management facility for appropriate disposal during operations and mine closure. The non-valuable or gangue minerals which will constitute approximately 80% of the mill feed result in the production of tailings requiring management. A conceptual flow diagram of the milling process is shown below.

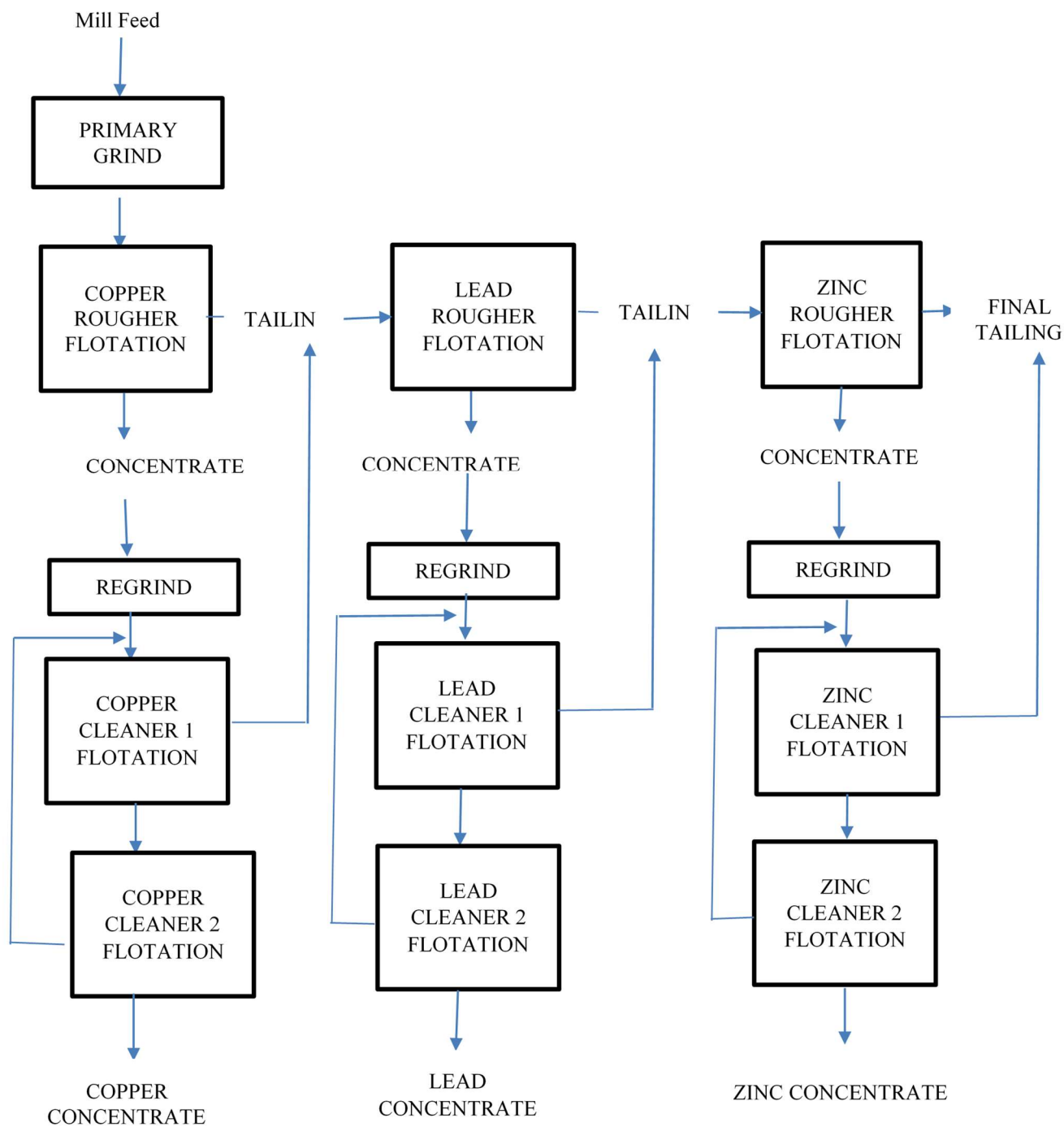


FIGURE: CONCEPTUAL PROCESS FLOWSHEET

Tailings Treatment and Management Strategy

Tailings, also contain iron sulfides as well as other metallic sulfide minerals and are managed accordingly to mitigate acid generation and leaching. When tailings are first produced, they are oversaturated with respect to water content and are pumped in a slurry.

All tailings will be deposited on a dry stack tailings management facility (TMF). The cleaned and filtered tailings will be dewatered and transported by truck or conveyor belt to the TMF where they are spread, stacked and compacted by a dozer. All water generated by the dewatering process is recycled and pumped back to the concentrator for reuse in the process circuit. The dewatered tailings have a low moisture content and is expected that no supernatant pond will form as they are compacted in the TMF. Rainfall on the TMF is expected and run-off collection is required. All water will be collected from the TMF in a lined collection pond at the south edge of the TMF. Water from the lined TMF collection pond will be pumped back to the concentrator for reuse in the processing circuit. The dewatered tailings will exit the concentrator plant via conveyor onto a storage pad with 24 hours of capacity. The tailings will be loaded and hauled via 35 or 40 tonne articulated trucks to the TMF. With an expected 800 tonnes per day of tailings, this will result in 1.5 or 1.0 trucks per hour depending on the size of the truck. Once or twice per shift, the truck operator will spend up to one hour with a dozer and roller compactor to grade and compact the tailings. The expected cycle time to the farthest area of the TMF is under 7 hours while the closest will be 4 hours. This allows more than sufficient time for haulage, grading and compacting in a 10 hour work shift.

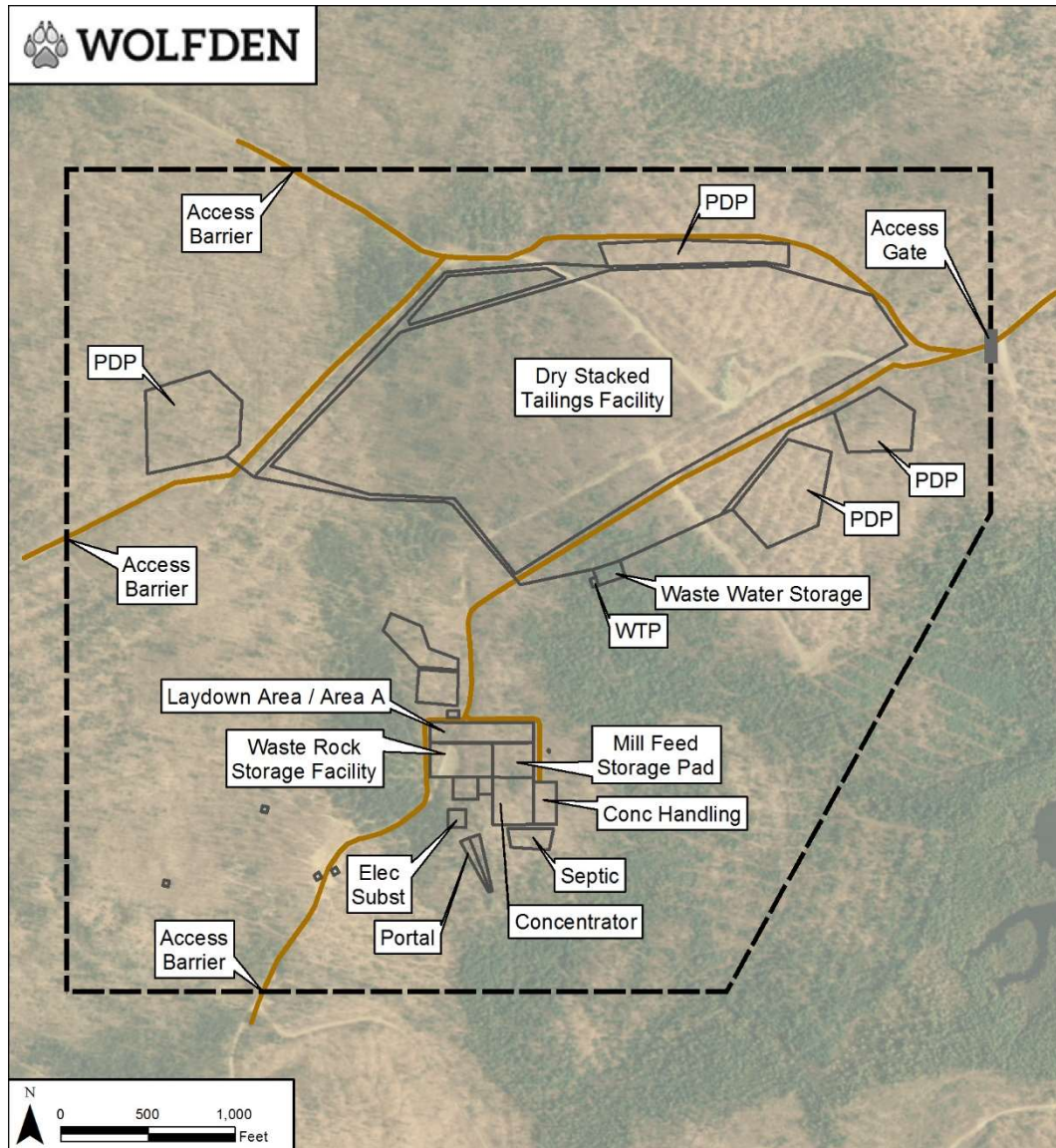
Sub-aerial (dry stacked) tailings are the only above ground tailings management method allowed under the DEP Chapter 200 rules for Group A and Group B mine waste. The sub-aerial TMF will be designed in accordance with requirements (including a composite liner and leachate collection) of Chapter 200 Subchapter 5 Section 21 Mine Waste Unit Design Standards. Leachate ponds that collect water that encounters tailings are also governed by these standards. TMF ground slopes of 20% to 30% may be used for dry stack tailings. The maximum height of the TMF cells when completed at Pickett Mt. are not expected to exceed 22 feet and may average less than 15 feet.

Once compacted, these tailings will not be subject to infiltration of water and intrusion of atmospheric oxygen which will mitigate the oxidation of sulfide minerals. Management of dry stacked tailings placed within a lined containment facility, that is progressively closed during mine operation will control leaching of metals and provide long term protection to water resources (groundwater and surface water). The TMF would be designed with run-on controls to prevent contact with surface water run-off. During the operating period of the dry stacked tailings facility, contact water (precipitation) is actively managed.

An example of similar tailings deposition is Cerro Lindo (Peru) show in the following collection of images. Although the climate in Peru is drier than in Maine, the concept is the same. Sub-aerial tailings are currently used in other cold regions including Alaska, Minnesota and Canada. In most cases in cold weather climates, the tailings are progressively covered to optimize water treatment and reduce the remaining area requiring



~~Cerro Lindo Moist Cake Disposal (1:2 Slope)~~



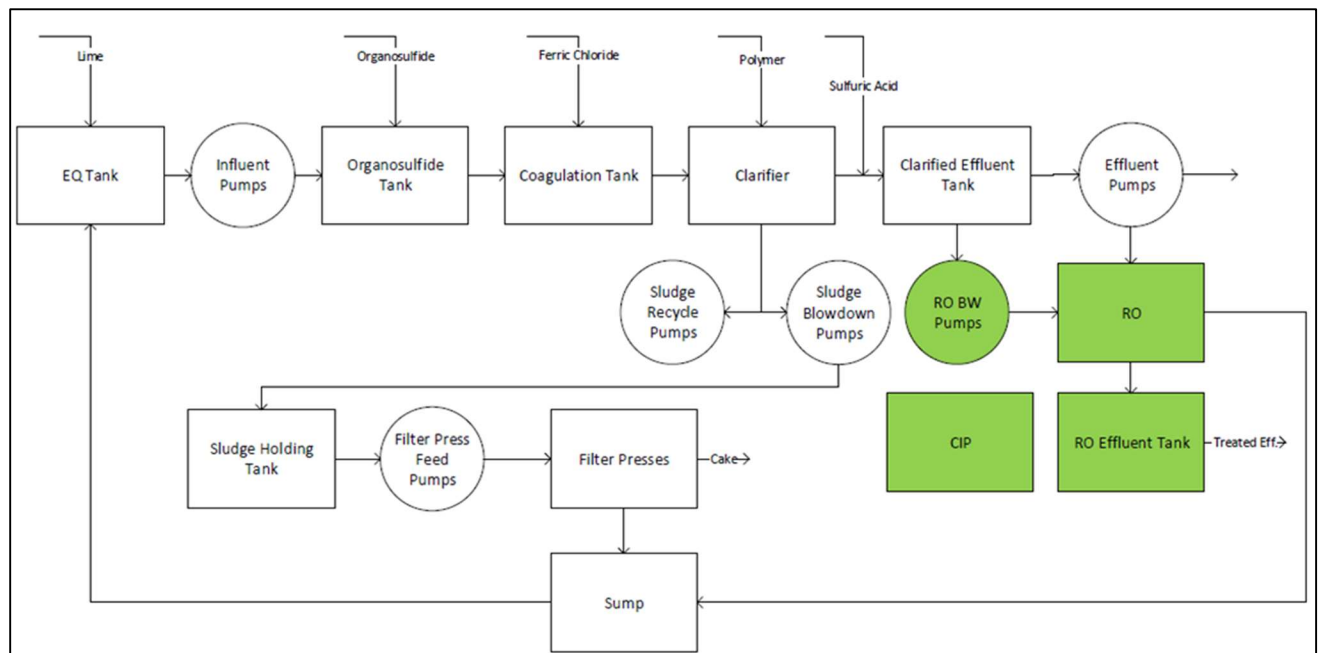
Conceptual Tailings Facility at Pickett Mountain

The figure above illustrates a dry stack tailings facility. The tailings stack features an outer side slope of 20% raised to a maximum height of about 22 feet (7 metres). The volume of tailings in this model is approximately (1,400,000 m³), equivalent to about 2.6 Mtonnes when fully consolidated or compacted to 88 wt% solids.

Mine Water Management and Treatment

All process and seepage water into the mine as well as precipitation landing outside of the tailings facility footprint are collected via run-off ditching and routed to the south eastern (down gradient) corner of the project site into a lined raw water pond in order to contain all water collected on the project site. Seepage water from tailings as well as precipitation water

onto the tailings facility are collected separately and pumped into the mill as recycled water. A series of berms will be designed to re-route precipitation water outside of project footprint in order to reduce contact with site and minimize potential impact. Once the water is collected in the raw water pond, it is pumped to the water treatment facility. The technological state of mine water treatment is very advanced as a form of waste water treatment with processes designed to adjust pH, remove sulfates and metals producing a high quality effluent and a high density solids waste stream (sludge) the latter of which is thickened by a conventional filter press to produce a sulfate filter cake. The solid filter cake will be placed underground in the mine. Excess water from the filter press is returned to the influent equalization tank for treatment. The conceptual treatment train is show in the following figure. The treated effluent may then be recharged to groundwater with no chemical impacts via underground infiltration structures. A Clean In Place (CIP) system is designed within the plant which is used for cleaning the interior of pipes and vessels as well as reverse osmosis and micro/nano filtration systems without having to remove them and clean them manually. This system is not a water treatment function but rather a maintenance function to the rest of the plant. Recharge of treated water to groundwater is also protective of surface water that eventually receives groundwater.



Mine Water Treatment Process Flow Diagram

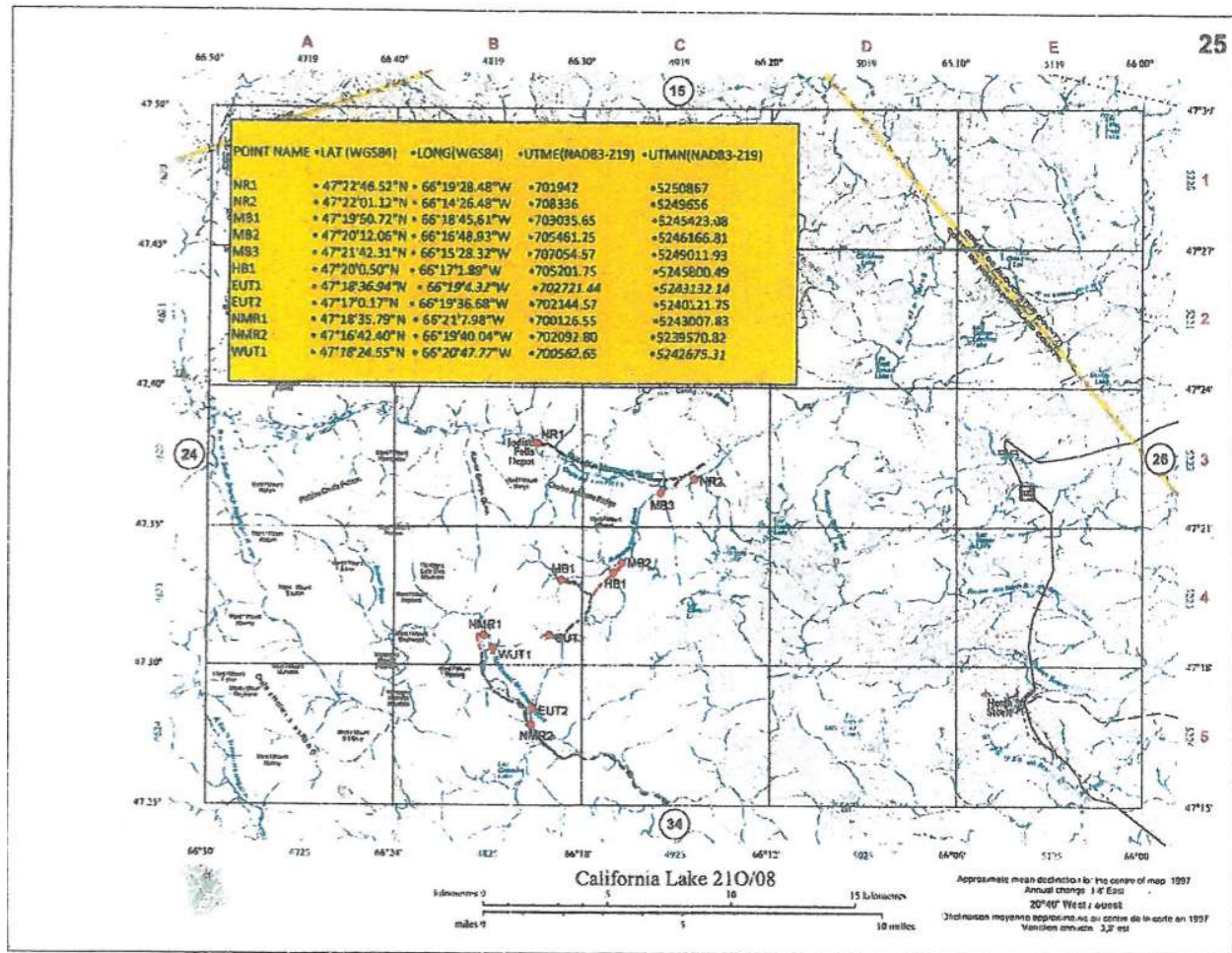
Notes:

EQ= Equalization (Tank); RO= Reverse Osmosis, BW= Backwash, CIP=Clean in Place (Tank)

The treatment plant will be operated in accordance with an operations and maintenance plan that will specify storage and management of chemical reagents and actions to be taken to prevent spills and accidental releases and to address spill clean-up and reporting should an accidental spill occur.

The groundwater quality will be monitored quarterly during the life of the mine and for a period of time post-closure that is specified in the mining permit issued by the DEP. Monitoring will occur at locations where mining activities have a reasonable potential for impact to groundwater and surface water. In general, these parameters will be based on baseline background water quality data and consideration of parameters related to mining operations (metals, pH, specific conductance and inorganic parameters such as sulfate). Surface water and sediment quality will also be monitored under an approved program during mine operations and for a post-closure period specified in the mining permit. The Department may require additional sampling of aquatic biological resources and monitoring of specific parameters at certain structures including water storage ponds, leachate collection systems and underdrains.

The following tables summarize of ground water variances for a full list of elements and characteristics in ground water surrounding the Halfmile Mine owned by Trevali Mining Corporation located West of Miramichi, NB. Sampling for Halfmile was completed by the environmental team; typically a senior level environmental engineer or environmental engineering student. Samples were collected by lab standards then packed and sent to a laboratory for analysis by RPC Science and Engineering (Research and Productivity Council), a certified laboratory based in Fredericton, New Brunswick. It can be noted that certain non-targeted and non-harmful minerals that may be higher than background levels can be rectified with the addition of a reverse osmosis system downstream of the chemical treatment facility proposed for Pickett Mountain. The mechanical type of filtration is able to draw these final minerals from the water and ensure the final treated quality is equal to or better than the background (baseline approved) quality level. Confirmation of this by the a water treatment plant provider is attached to this petition.



Halfmile Mine Water Sampling Locations Map

Halfmile Mine Analysis of Metals in Water		Ground Water Well											
Sample Identification		327776-1	327776-2	327776-3	327776-4	125083-1	125083-3	125083-4	125083-2	Variance	Variance	Variance	Variance
Well Identification		MB-1	MB-3	HB-1	MB-2	MB1	MB3	HB1	MB2	MB1	MB3	HB1	MB2
Date Sampled:		28-Aug-19	28-Aug-19	28-Aug-19	28-Aug-19	7-Sep-11	7-Sep-11	7-Sep-11	7-Sep-11	NA	NA	NA	NA
Analytes	Units												
Aluminum	µg/L	3	17	24	27	8	43	56	44	-5	-26	-32	-17
Antimony	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Arsenic	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Barium	µg/L	2	3	3	3	2	2	3	2	0	1	0	1
Beryllium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Bismuth	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Boron	µg/L	2	0	0	1	1	1	2	1	1	-1	-2	0
Cadmium	µg/L	0.02	0	0	0	0	0	0	0	0.02	0	0	0
Calcium	µg/L	6250	8620	8230	8490	4910	6900	6770	6780	1340	1720	1460	1710
Chromium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Cobalt	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Copper	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Iron	µg/L	0	20	30	30	0	60	90	60	0	-40	-60	-30
Lead	µg/L	0	0	0	0	0	0.1	0.1	0	0	-0.1	-0.1	0
Lithium	µg/L	0.1	0	0	0	0	0	0	0	0.1	0	0	0
Magnesium	µg/L	840	900	1040	900	630	790	910	780	210	110	130	120
Manganese	µg/L	0	4	10	9	0	5	9	6	0	-1	1	3
Mercury	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Molybdenum	µg/L	0	0.2	0.1	0.1	0.1	0	0	0.1	-0.1	0.2	0.1	0
Nickel	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Potassium	µg/L	430	380	430	380	370	320	350	320	60	60	80	60
Rubidium	µg/L	0.2	0.5	0.4	0.5	0.2	0.3	0.3	0.3	0	0.2	0.1	0.2
Selenium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Silver	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	µg/L	2190	1610	1750	1680	1730	1400	1380	1400	460	210	370	280
Strontium	µg/L	22	25	24	25	15	18	18	18	7	7	6	7
Tellurium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Thallium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Tin	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Uranium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Zinc	µg/L	3	1	2	1	0	2	0	2	3	-1	2	-1

Halfmile Mine Groundwater Metals Variance September 2011 – August 2019

Halfmile Mine Water Chemistry Analysis		Ground Water Well											
Sample Identification		327776-1	327776-2	327776-3	327776-4	125083-1	125083-3	125083-4	125083-2	na	na	na	na
Well Identification		MB-1	MB-3	HB-1	MB-2	MB1	MB3	HB1	MB2	MB-1	MB-3	HB-1	MB-2
Date Sampled:		28-Aug-19	28-Aug-19	28-Aug-19	28-Aug-19	7-Sep-11	7-Sep-11	7-Sep-11	7-Sep-11	NA	NA	NA	NA
Analytes	Units												
Ammonia (as N)	mg/L	0	0	0	0	0	0	0	0	0	0	0	0
pH	units	7.5	7.5	7.5	7.5	7	7.1	7.1	7.1	0.5	0.4	0.4	0.4
Acidity (as CaCO ₃)	mg/L	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	mg/L	4	0	0	0	0	0	0	0	4	0	0	0
Solids - Total Suspended	mg/L	0	0	0	0	0	0	0	0	0	0	0	0
Conductivity	µS/cm	54	62	60	60					54	62	60	60
Hardness (as CaCO ₃)	mg/L	19.1	25.2	24.8	24.9	14.9	20.5	20.6	20.2	4.2	4.7	4.2	4.7

Halfmile Mine Groundwater Chemistry Variance September 2011 – August 2019

The mine water balance will be carefully managed to take advantage of recycling of mine waste contact waters including precipitation run-off and seepage water. These anticipated water streams volumes are evaluated to determine the design capacity of the water treatment system. These water sources will be used in the beneficiation of the mineralize rock (milling and

flotation) are compared to those design flows to determine the extent of water recycling and excess treated water requiring recharge back to groundwater.

A preliminary mine water balance has been developed. This preliminary estimate assumes all infiltration /run-off within the footprint of the developed facility will be collected and treated in addition to approximately 30 gpm of seepage water. The annual average precipitation over the facility footprint is equivalent to an average flow of 175 gpm. This results in an average flow of approximately 205 gpm for use by the treatment facility.

The concentrator water balance indicates, after recycle, approximately 68.4 tonnes of make water (or approximately 13 gpm) such that the daily water balance of available water is greater than the water required. Therefore, net recharge of treated effluent back to ground, will be close to the natural recharge that is excluded within the developed facility footprint. Operation of the envisioned facility will therefore not require additional sources of water supply (groundwater or surface water) and the operation of the facility is sustainable with respect to water needs, water use and management.

C. Submittal Contents.

The following Attachments (A through Q) are provided to assist the LUPC's verification that the proposed rezoning would meet the criteria discussed in subsection B, above, and the balance of this Petition:

Attachment A A narrative description of the nature and basis for the subdistrict change being requested;

Attachment B A legal description and delineation of the property boundaries proposed for redistricting, including names, addresses and affiliations of current owners and any other entities having a legal interest in the property;

Attachment C Names and addresses of property owners located within 1,000 feet of the subject property;

Attachment D A preliminary plan for general location and timing of project elements;

Attachment E A location map drawn to scale on the most recent version of the USGS topographic map and a LUPC Land Use Guidance Map that indicates the area for which a D-PD Development Subdistrict designation is sought and the estimated boundaries of the ore body proposed to be explored or mined;

Attachment F A map drawn to scale of at least 1 inch to 100 feet showing existing site conditions, including contours at 10 foot intervals or less, water courses, unique or unusual natural conditions, forest cover, wetlands, known or likely deer wintering areas, lakes, ponds, existing structures, road and transportation routes, property boundaries and names of adjoining property owners, scenic locations and other prominent topographical and natural resource features;

Attachment G A soils map of low intensity that encompasses those portions of the property proposed for D-PD Development Subdistrict designation, including identification of soils used in the USDA Soil Series;

Attachment H Surficial and bedrock geology maps at a scale of 1:24,000, or largest scale available, of the property proposed for D-PD Development Subdistrict designation;

Attachment I A map and or description of the location of public, private and industrial water supplies as well as mapped aquifers located within a three-mile radius of the mining area or exploration site;

Attachment J A map and description of the location and extent of existing infrastructure to include roadways and transportation routes to be utilized, potential impacts on this existing infrastructure, as well as infrastructure to be constructed or improved;

Wolfden Mt. Chase LLC

Exhibit 25: Attachment A - Figures

Exhibit 25 Figures Include:

~~Figure 25-1 (Previously Attachment K—A map identifying) - significant natural resources and sensitive natural areas located within a three-mile radius of the mining area or exploration site including protected water bodies, significant wildlife and plant areas, fragile mountain areas, historic sites, scenic resources, public lands, registered critical areas, and LUPC subdistricts; site~~

~~**Attachment L**—A map and description of existing uses, such as recreational uses, within a three-mile radius of the mining area or exploration site;~~

~~**Attachment M**—A description of general measures that may be undertaken to assure that mining in the specified location will not have undue adverse impacts on existing uses and resources and measures that a permittee may take to avoid, minimize or mitigate any adverse impacts;~~

~~**Attachment N**—A description of socioeconomic impacts, both positive and negative, of the proposed metallic mineral mining or level C mineral exploration activities upon the immediate area and communities within and adjacent to the LUPC's jurisdiction likely to be affected by the proposed activities, as well as to the county and state;~~

~~**Attachment O**—An evaluation of the sufficiency of existing services and utilities, a description of any general measures necessary to increase those service capacities and an examination of the burdens on communities or government to provide those services;~~

~~**Attachment P**—An explanation of how this proposal is consistent with the standards and purpose of the D-PD Development Subdistrict; and~~

~~**Attachment Q**—A description of the anticipated site conditions following closure and the potential for future reclamation and beneficial use of the affected area.~~

Attachment A

Narrative Description of the Nature and Basis for the Requested Subdistrict Change

4.31.1 Consistency with D-PD Development Subdistrict Standards

This narrative addresses the nature and basis for the requested subdistrict change and describes how the project will be consistent with the D-PD development standards applicable to the project. This narrative summarizes why the project is realistic, the applicant's technical capacity to complete the project, the anticipated project schedule, the relationship of the proposed D-PD subdistrict to other existing subdistricts and uses, and how the project will avoid and minimize impacts to water quality and other natural resources.

The area proposed for the project is currently zoned as a general management subdistrict. The proposed project is a major planned development that must be conducted within a D-PD Development subdistrict as required by the LUPC for metallic mineral mine projects consistent with standards for said subdistricts and within the intent and provisions of 12 M.R.S.A. Chapter 206A. Under Chapter 685-B, Development Review and Approval, a permit is not required for metallic minerals mining projects that are reviewed under the Maine Metallic Mineral Mining Act. This project will require review and permitting by the DEP under its Chapter 200 rules for Metallic Mineral Exploration, Advanced Exploration and Mining since all metallic mineral mining activity within a D-PD district is permitted through the DEP. The LUPC must certify to the DEP that the proposed development is an allowed use and that the proposed development meets applicable land use standards established by the LUPC and not otherwise considered as part of the DEP's review.

The mineralized rock at the Pickett Mountain Deposit contains high grade concentrations of zinc, and lesser copper, lead, gold and silver at tonnages indicating the project is economically feasible, and can be financed and completed. Financial capacity and project financing are discussed in **Exhibit H**. Wolfden, through its own engineering staff, its current specialized consultants in metallurgy and tailings management, supported by the mining engineering capabilities of Wood, has the technical capacity and expertise to design, construct and operate the project through final reclamation.

The project schedule is dependent on the LUPC's approval of this Petition. Wolfden anticipates this process could take up to a year. Wolfden will conduct any additional required natural resource studies in the Spring and Summer of 2020 (wetland, flora, wildlife habitat, and archeological resources). Wolfden also will work with the DEP to establish a baseline environmental characterization program that will require two years of data collection to complete. Once completed, the mine permit application will be submitted for DEP review. It is anticipated that review and public comment could take up to one year. This could conceivably

allow the construction phase of the project to commence in 2023-2024. The duration of mining would be 10 years from that point.

Based on correspondence with the MDIF&W and MNAP and current information from preliminary site surveys, potential impacts to protected wildlife, habitat and flora within and adjacent to areas proposed for development should be limited to areas containing forested wetland and associated intermittent streams within upland areas. Wolfden is committed to working with the regulatory agencies to avoid impacts to the extent possible, to minimize impacts and compensate where unavoidable. In this manner, the functions and values of upland wetlands and streams within the local Pickett Pond / Pleasant Lake watershed that are important to wildlife habitat and surface water quality can be maintained during the active life of the project. Upon reclamation, impacts that were initially unavoidable will be mitigated.

The project location is approximately 6 radial miles from Patten, the closest town. The project location is entirely dependent on the presence and location of a potentially economic mineral deposit. The project location is exempt by definition from adjacency. The proposed rezoning includes 528.2 contiguous acres which meets the minimum requirements under Chapter 10 (10.21, H (D-PD)) of 50 acres for metallic mineral extraction projects. Of this, approximately 106 acres will result in surface disturbance to construct necessary mining facilities. Wolfden has evaluated project mining requirements to minimize the footprint of the proposed project and to place above ground facilities adjacent to each other to construct a compact and efficient operations area. The remaining area to be rezoned encompasses the subsurface areas of mineralized rock and subsurface treated water infiltration galleries, and buffers around surface facilities. The rezoning will occur entirely within a General Management subdistrict and is not adjacent to and will not impact Protection subdistricts in effect at this time. Within a three-mile radius of the site, the protection subdistricts present include forested and scrub shrub wetlands adjacent to great ponds (Pickett Pond, Pleasant Lake and Mud Lake) and associated stream drainages, and wetlands of special significance between Mud Lake and Pleasant Lake. Fish and wildlife subdistricts are located to the northwest. A recreation subdistrict is designated surrounding Green Mountain Pond and Lane Brook Pond, located greater than 3 miles from the site. The location map showing the existing conditions, proposed structures and existing and proposed subdistrict boundaries is provided in **Exhibit D-1**.

As discussed in **Section B (3)(d)** and **Appendix A-Attachment Q** the project operations will include comprehensive engineered facilities to collect and treat waters that come in contact with rock and earthen materials that are mined in the subsurface and brought to the land surface for beneficiation or long term management. These water collection, treatment and treated water recharge facilities will substantially protect groundwater and surface water quality during and after active mining. The plan for mine reclamation outlined in **Attachment Q** describes how the affected areas will be restored and returned to pre-existing or comparable conditions including forested habitat at the end of the project.

As described in this Petition, the project is located at distances greater than 400 feet from any property line, is reasonably self-sufficient and self-contained, provides for its own water and domestic sewage services, maintenance of roads, solid waste disposal and to the extent possible, fire protection and security.

This Petition contains discussion of other required criteria under Chapter 12 of the LUPC's rules for Mining and Level C Mineral Exploration Activities (**Appendix A Appendices and Narratives**). Based on these considerations, the proposed rezoning is consistent with the D-PD subdistrict standards.

Attachment B

Legal Description and Delineation of the Property Boundaries Proposed for Redistricting

~~Legal Description (please see attached Property Map)~~

~~A CERTAIN PIECE OR PARCEL OF LAND LOCATED WITHIN TOWNSHIP 6, RANGE 6 WELS (T6, R6 WELS), COUNTY OF PENOBSCOT, STATE OF MAINE AND BEING MORE PARTICULARLY BOUNDED AND DESCRIBED AS FOLLOWS:~~

~~BEGINNING AT A POINT LOCATED IN THE MAINE STATE PLANE COORDINATE SYSTEM — NAD 83 (EAST ZONE — 1801), AS MEASURED IN UNITED STATES SURVEY FEET AT NORTH: 898544.15, East: 994010.57;~~

~~THENCE RUNNING THROUGH THE LAND OF THE GRANTOR ON A COURSE OF NORTH NINETY DEGREES ZERO MINUTES ZERO SECONDS WEST (N 90° 00' 00" W) A DISTANCE OF THREE THOUSAND SEVEN HUNDRED NINETY-TWO AND THIRTY-THREE HUNDREDTHS (3792.33) FEET TO A POINT LOCATED AT NORTH 898544.15, EAST 990218.25;~~

~~THENCE RUNNING THROUGH THE LAND OF THE GRANTOR ON A COURSE OF NORTH ZERO DEGREES ZERO MINUTES ZERO SECONDS EAST (N 0° 00' 00" E) A DISTANCE OF FOUR THOUSAND SEVEN HUNDRED TWENTY-SIX AND THIRTY-FOUR HUNDREDTHS (4726.34) FEET TO A POINT LOCATED AT NORTH 903270.50, EAST 990218.25;~~

~~THENCE RUNNING THROUGH THE LAND OF THE GRANTOR ON A COURSE OF NORTH NINETY DEGREES ZERO MINUTES ZERO SECONDS EAST (N 90° 00' 00" E) A DISTANCE OF FIVE THOUSAND THREE HUNDRED ELEVEN AND FIFTY-ONE HUNDREDTHS (5311.51) FEET TO A POINT LOCATED AT NORTH 903270.50, EAST 995529.75;~~

~~THENCE RUNNING THROUGH THE LAND OF THE GRANTOR ON A COURSE OF SOUTH ZERO DEGREES ZERO MINUTES ZERO SECONDS EAST (S 0° 00' 00" E) A DISTANCE OF ONE THOUSAND NINE HUNDRED SIXTY-NINE AND THIRTY-ONE HUNDREDTHS (1969.31) FEET TO A POINT LOCATED AT NORTH 901301.19, EAST 995529.75;~~

~~THENCE RUNNING THROUGH THE LAND OF THE GRANTOR ON A COURSE OF SOUTH TWENTY-EIGHT DEGREES FIFTY-ONE MINUTES TWENTY SECONDS WEST (S 28° 51' 20" W) A DISTANCE OF THREE THOUSAND ONE HUNDRED FORTY-SEVEN AND EIGHTY-EIGHT HUNDREDTHS (3147.88) FEET TO THE AFOREMENTIONED POINT OF BEGINNING.~~

~~SAID PARCEL CONTAINS FIVE HUNDRED TWENTY-EIGHT AND TWENTY-THREE HUNDREDTHS (528.23) ACRES MORE OR LESS~~

~~THE ABOVE DESCRIBED PARCEL IS A PORTION OF LAND OWNED BY THE GRANTOR AS DESCRIBED IN BOOK 14672, PAGE 27 OF THE PENOBSCOT REGISTRY OF DEEDS LOCATED IN BANGOR, MAINE.~~

Attachment C

~~4.41.1 Names and Addresses of Property Owners Located Within 1,000 feet of the Wolfden Property~~

~~No properties are located within 1,000 of the area proposed for rezoning.~~

Please see

Wolfdon Mt. Chase LLC

Exhibit 25: Attachment B for property locations- Reports

~~ABUTTING LAND OWNER ADDRESSES:~~

~~RYAN R. ALLEN~~

~~8 KNOTTA WAY~~

~~NAPLES, MAINE 04055~~

~~AROOSTOOK TIMBERLANDS, LLC~~

~~P.O. BOX 5777~~

~~SAINT JOHN, NEW BRUNSWICK~~

~~E2L 4M3, CANADA~~

~~CASSIDY TIMBERLANDS, LLC~~

~~C/O BENJAMIN D. CARLISLE~~

~~P.O. BOX 637~~

~~BANGOR, MAINE 04402-0637~~

~~RAYMOND & JEANETTE GALLAGHER~~

~~P.O. BOX 478~~

~~PATTEN, MAINE 04765~~

~~GARDNER LAND COMPANY, INC~~

~~NICKOLAS IRELAND~~

~~P.O. BOX 189~~

~~LINCOLN, MAINE 04457~~

~~HERBERT C. HAYNES, INC.~~

~~C/O GINGER MAXWELL~~

~~P.O. BOX 96~~

~~WINN, MAINE 04495~~

~~LAKEVILLE SHORES, INC.~~

~~C/O GINGER MAXWELL~~

~~P.O. BOX 96~~

~~WINN, MAINE 04495~~

~~BERT S. LORD~~

~~(POSSIBLY)~~

~~131 WILEY ROAD~~

~~LITTLETON, MAINE 04730-6508~~

~~DAVID PORTER~~

~~131E NEWPORT ROAD~~

~~STETSON, MAINE 04488~~

~~RAYE & KATHY PORTER~~

~~131 EAST NEWPORT ROAD~~

~~STETSON, MAINE 04488~~

~~KYLE & JON WESCOTT~~

~~191 LOCATION ROAD~~

~~BELGRADE, MAINE 04917~~

Attachment D

~~4.51.1 Preliminary Plan for General Location and Timing of Project Elements~~

~~Please see Preliminary Site Plan Exhibit D-2 for general location of buildings and facilities and the Schedule under Section 4 Project Description for timing of project elements. The phases of the project development are discussed in the Project Description.~~

Attachment E

~~Location Maps Indicating the Area of Proposed D-PD Development Subdistrict Designation Showing Estimated Boundaries of the Ore Body~~

Attachment F

Existing Site Conditions Map (1 inch to 100 feet)

Please see Exhibit A-1 for adjoining property owner information.

Exhibit 25 Supporting Documents Include:

IF&W - Information ~~also contained in Exhibit D-1.~~

Attachment G

**Low-Intensity Soils Map of the Property Proposed for D-PD Development
Subdistrict Designation**

Attachment H

**Surficial and Bedrock Geology Maps of the Property Proposed for D-PD
Development Subdistrict Designation**

Attachment H-1 Surficial Geologic Map

Attachment H-2 Bedrock Geologic Map

Attachment I

Map and Description of Water Supplies and Mapped Sand and Gravel Aquifers Located within a Three Mile Radius of the Proposed Mine Area

~~4.5.11.1.1 Water Supplies and Mapped Aquifer Description~~

~~A medium yield sand and gravel aquifer has been mapped along the north shore of Pleasant Lake. Indicated yields are ≥ 10 gallons per minute. The yield of the residential well on the south side of Pleasant Lake is reported as ≥ 8 gallons per minute. It is presumed that all five residential lots have private water supplies, though this has not been confirmed by a well survey. There are no other known private or public water supplies within a three-mile radius of the site. The attached figure depicts these features in addition to inferred surface water divides and groundwater flow direction in the vicinity of the site.~~

Attachment J

Map and Description of Existing Transportation Infrastructure Routes, Impacts and Improvements

4.6.1.1 Description of Proposed Transportation Infrastructure Routes, Impacts and Improvements

The following transportation evaluation describes the proposed route to be used by trucks carrying mineral concentrate from the proposed Pickett Mountain site to the US-Canadian border, the level of additional traffic, potential impacts and potential improvements to promote safety. The proposed route is dependent on the final locations where mineral concentrate will be shipped for further processing (smelting) in Canada. The processing locations have not been finalized and therefore the proposed route could be subject to change.

4.6.11.1.1 Transportation Need

The proposed mining activity has an anticipated mill feed rate of 1,000 tonnes/day with anticipated metal recoveries, total concentrate yields will be approximately 160 tonnes/day of concentrate for shipment (352,740 lbs). Typical tractor trailer tare weights (empty weight including driver and fuel) vary and range from 26,000 to 37,000 lbs. Using an average of 32,000 lbs tare weight allows 48,000 lbs for cargo; requiring approximately 7 shipments/day.

Roads within the area will also be used for employee travel to and from the mine and discussed later in this section.

Route Description

The proposed truck route consists of gravel roads on private property from the Pickett Mountain site to public roads that include three rural state highways, and one US Interstate Highway (See **Figure Attachment J** for locations and sections). From the site, trucks will travel on private gravel roads to Maine (ME) State Route 11 (ME SR-11), hence northeast to the intersection of ME SR-212. Trucks will travel southeast along ME SR-212 to Oakfield, (where it turns into Smyrna-Oakfield Road) and enter Interstate 95 (I-95) traveling east to Houlton and the Canadian-US border and proceed to the Canadian National Highway in Woodstock New Brunswick. These roads are more specifically described below:

- 5.1 miles of gravel roads (consisting of an unnamed road, Pleasant Lane Road, and Bear Mountain Road). Elevations from the Pickett Mountain site to Maine (ME) state route (SR) 11 drop from approximately 1200 to 850 feet mean sea level (MSL) from west to east.
 - Existing gravel roads are currently in good condition, and well maintained for logging operations conducted on and around the property. An agreement is in place with land owning neighbors to allow right of way using this set of gravel roads outside of the Wolfden property boundary. Confirmation of the right of way is in the form of a letter within this report. Confirmation of right to upgrade and maintain is established in the original agreement between both companies registered on April 2, 2020 in book 6000 on page 29.

- The gravel roads are single lane varying in width from 10 to 15 feet with drainage ditches where elevated. One bridge crossing is present.
 - The permanent bridge crossing at Pickett Pond outlet, consists of concrete abutments with two layers of wood decking and steel beams for support. The bridge deck is approximately 15 feet wide with a 20 feet span. The bridge appears to be in good structural condition.
 - Intersection of the gravel road with ME SR 11 has a good turning radius. The gravel road width at the shoulder of SR 11 is approximately 55 feet.
 - There is no available traffic data for the gravel roads mostly used for logging traffic in addition to access to a seasonal camp on the south side of Pleasant Pond.
 - The gravel roads are also used for recreational purposes by the public including all terrain vehicles (ATVs) and snowmobiles.
- 19 miles of 2 lane rural state highway from the intersection of Bear Mountain Road with ME SR 11 to the intersection of Smyrna Oakfield Road with I 95 (including 7.3 miles along ME SR 11 and 10.3 miles along ME SR 212, and 1.4 miles along the Smyrna Oakfield Road). ME SR 11 and ME SR 212 are characterized by rolling hills ranging in elevation from approximately 550 to 1150 feet MSL. Posted speed limits are 50 MPH on ME SR 11 and 45 MPH on ME SR 212, and 35 MPH on the Smyrna Oakfield Road. Each road has an approximate 11 feet wide travel lane with 3 foot shoulder in both directions.
 - Roads are in good to fair condition and include bridge crossings over West Branch of Mattawamkeag River on ME SR 11 and over East Hastings Brook on ME SR 212.
 - Average Annual Daily Traffic (AADT) presented on Maine Department of Transportation (Maine DOT) website ranged from 470 1270 along ME SR 11 and ME SR 212 in 2015. Ten crashes were reported from 2017 2019 at intersection of Clark Road and SR 212 in town of Merrill according to Maine DOT Crash Portal. The Level of Service is A (light & free flowing) on all state roads within the route.
 - Intersections along state routes have good turning radiuses.
 - 9.1 miles of US Interstate Highway (I 95) from SR 212 to US Canada border, with a posted speed of 75 MPH, 10 foot right shoulder both directions.
 - Road is in good condition.
 - AADT data from Maine DOT website ranged from 1480 2470 in 2015, 78 crashes along I 95 section from 2017 2019 according to Maine DOT Crash Portal with most assumed as animal collisions, with a Level of Service of C (stable).
 - On-ramps to be used along proposed route have good turning radiuses.

4.6.21.1.1 Traffic Increases

- Proposed traffic to the Pickett Mountain site includes a peak 30 workers per shift with two shifts per day offset by one hour. This results in a maximum of 60 peak hour trip/hour during shift changes on ME SR 11. It is expected that the majority of workers employed

at the mine will be from local work force, many of whom may currently use portions of this route for current employment.

- Maine DOT requires a traffic permit to be obtained if traffic to be added to a route is greater than or equal to 100/hour. Proposed traffic increase will not require a traffic permit.
- The daily traffic to and from the site (assuming 30 workers and two shifts/day plus 7 shipments of concentrate) results in 134 additional trips/day on ME SR-11 (an average of 5.6 vehicles/hour. The road has an hourly capacity of 1800 vehicles and its use is currently well under that capacity.
- Shipping of concentrate via trucks will only occur during daytime hours.

4.6.31.1.1 Impacts

The proposed route for hauling concentrate consists of state and federal highways. The weight limit will be restricted by the Federal Interstate which allows a maximum of 80,000 pounds (lbs) for both five and six axel tractor trailer configurations. State roads allow up to 88,000 lbs for 5 axel configurations for certain commodities including unconsolidated rock material. Planned weight load will be 80,000 lbs. The private gravel roads are constructed for logging trucks with the similar weight constraints.

As identified previously, on average seven truck shipments of concentrate will occur daily. This small level of increased traffic will not burden or impact proposed traffic route.

As discussed in previous sections, the additional volume of traffic will not require a traffic permit nor represent a burden or impact on the existing traffic capacity of the proposed route.

4.7.1.1 Anticipated Improvements

4.7.11.1.1 Unimproved Gravel Roads

Improvements on existing gravel roads will be conducted to improve year round use, safe passage of vehicles on a single lane road and public safety.

- Maintenance of spring thaw impacts along the gravel roads will be undertaken by Wolfden. Wolfden will evaluate the scope of maintenance and improvements during the design analysis for the mine under the mining application (mine design and permitting phase).
- During the mine design analysis widening of the gravel roads will be evaluated for safe passage of logging trucks, concentrate trucks, and workers. A maximum width between 22 and 25 feet to the road shoulder should be sufficient for safe passage of large vehicles and recreational traffic (ATVs and snowmobiles in winter).
- During that analysis, consideration will also be given to providing a separate lane for safe passage of recreational vehicular traffic (ATVs and snowmobiles).

- ~~Maintenance of bridge decking at Pickett Pond outlet crossing, may include improvement or replacement of the wood decking as dictated by normal wear and tear of truck traffic. During the mine design analysis, widening of the bridge will also be evaluated for safety considerations. If widening of the bridge is proposed during mine design and permitting phase the replacement will be a similar structure with concrete abutment and footings allowing the natural streambed to be maintained. A replacement structure would be designed to accommodate a 25-year frequency storm event with arches located landward 1.2 times the channel width at normal high water. Work in the stream would be minimized allowing the streams natural structure and integrity to remain intact.~~
- ~~A cooperative road maintenance agreement, in general, will be established between Wolfden and commercial loggers whom access their own private property as well the Wolfden property.~~

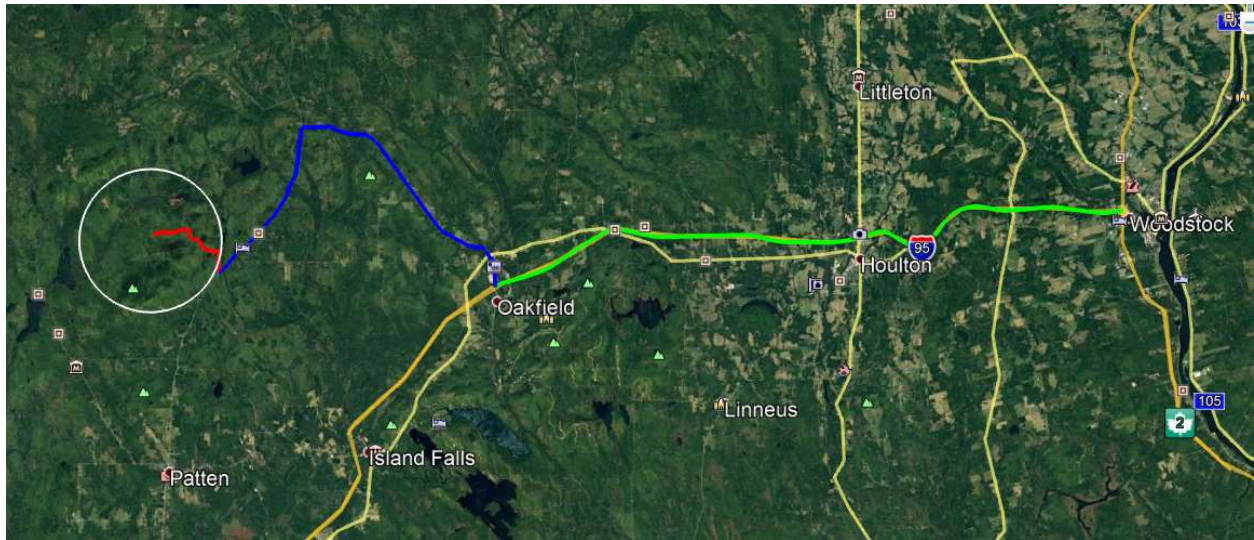
4.7.21.1.1 Rural State Highways

Potential Improvements to state highways will be for traffic safety. Wolfden will hire an MEDOT approved transportation engineer familiar with the area to consider, evaluate and design improvements, as needed, during the mine design and permitting phase. These improvements may include:

- ~~Signage and lighting at intersection of Bear Mountain Road and ME SR-11 indicating truck entering and leaving Bear Mountain Road (i.e. "Trucks Entering").~~
- ~~Addition of deceleration and acceleration lanes at the intersection of Bear Mountain Road and ME SR-11 for trucks to avoid obstruction of traffic during acceleration and deceleration periods.~~
- ~~Widening right shoulder at intersection of ME SR-11 and ME SR-212 in Moro Plantation to facilitate right turning truck traffic.~~

Summary

~~The proposed traffic route (Appendix J and below) and additional traffic levels do not constitute an impact on the existing road infrastructure. Wolfden will work with stakeholders (LUPC, the public, commercial loggers, and MEDOT) to accommodate modifications to ensure public safety and recreational access along the proposed private and state highway routes.~~



Proposed Truck Route from Pickett Mountain Site with unimproved gravel roads in red, 2-lane rural state highways in blue, and US Interstate Highway in Green. An approximate three-mile radius is drawn around the site (white)

Attachment K

~~Map Identifying Significant Natural~~ Request – Wolfden Resources ~~and Sensitive Natural~~ ~~Areas Located Within a Three-mile Radius of the Mining Area~~ Metallic Mineral Mining Rezoning, T6R6 WELS

~~Note the attached map reflects only currently published data from National Wetland Inventory maps, LUPC management subdistricts and protection subdistricts. A Phase 0 Archeological survey will be conducted in Spring 2020 as well as wetland delineations and vernal pool assessments. The P-SG designation for Soils and Geology may reflect fragile mountain areas or rock outcrop and talus slopes which could provide habitat for bats. Other features if field confirmed in spring 2020 would be added to this map.~~

Attachment L

Map and Description of Existing Uses Within a Three-mile Radius of the Proposed Mining Area

As discussed in prior sections, the area surrounding the Pickett Mountain Project site is wooded and the primary use is forest industry related. Six residential properties with seasonal dwellings are present on the southern and northern shore of Pleasant Lake which are used for recreation there along with other great ponds. The area is also used for motorized recreation, including ATVs and snowmobiles. The attached map provides a 3 mile radius around the site indicating the location of these features which are further described below.

Lakes and Ponds

A three-mile radius from the perimeter of the area proposed for rezoning encompasses extends to the eastern shoreline of Upper Shin Pond and encompasses Pleasant Lake, Mud Lake, Huntley Duck Pond, Picket Mountain Pond, Grass Pond, Bear Mountain Pond. Tote Pond located between Grass Pond and Bear Mountain Pond drains eastward to Hale Pond, which then drains south. Green Pond, located to the north of Hale Pond, drains north to the West Branch of the Mattawamkeag River entering south of Duck Pond.

Based on the USGS Green Mountain Quadrangle 7.5 minute series topographic map (1986 Provisional Edition) Hale Pond, Bear Mountain Pond, the un-named pond, Grass Pond and Pleasant Lake are accessible by private un-improved roads (gravel logging roads). These ponds are typically located within 500 feet of an unimproved road. Mud Lake, Huntley Pond, Duck Pond, Green Pond and Picket Mountain Pond are typically located within 500 to 1,000 feet of a trail. The site would be visible from Pickett Mountain Pond and the eastern side of the unnamed pond. It would not be visible from the other ponds.

The level of use of these ponds lack quantitative information. Due their shallow nature and limited public access, it is expected the levels of use are low. A more detailed review through investigation with the public is currently underway to confirm the level of use of lakes and ponds within the 3 mile radius of the proposed boundary. Pickett Pond is very shallow with an average depth of approximately 2 to 3 feet. Pleasant Lake will have a higher level of use due the presence of six seasonal camps near or along its southern and northern shoreline and an average depth between 6 to 10 feet. Direct visual impacts will be realized from Pickett Mtn Pond however minimally. Nearby Pleasant lake will have no visual impact from the project. **Noise** from the project will impact both nearby bodies of water. Noise is discussed in section 15 in this report.

The eastern shore of Upper Shin pond is within the three-mile radius as depicted in Attachment L. The site is not visible to either Upper or lower Shin Pond or Ship Pond Village. The eastern shore of Upper Shin Pond contains approximately 20 private residences. Upper and Lower Shin Pond and surrounding area used actively year round for recreation by fishing, hunting, hiking, ATV, snowmobile

enthusiasts. Shin Pond Village and Mount Chase Lodge have year-round lodging and the former seasonal tent and RV campsites. Hunting on the parcel proposed for rezoning has not been observed by MNAP - Rare and Exemplary Botanical Features in Proximity to: Wolfden.

~~4.7.31.1.1~~ Campsites

The closest identified campsites are in Shin Pond Village, approximately five miles from the Site. No impacts from the project are anticipated at these sites.

Trails

As discussed previously, the area around the site with three miles contains a network of unimproved gravel roads, used primarily for logging in addition to access to seasonal residences along Pleasant Pond. In addition, also exists a network of isolated and interconnected trails that connect to these gravel roads. The only published hiking trail is located approximately 5 miles away to the summit of the Mount Chase approaching from the South. The site is not visible from the summit of Mount Chase.

Combined use ATV/snowmobile trails have been developed in the areas surrounding the site including portions of the ITS snowmobile trail system and groomed trails maintained by local clubs. The closest ATV/snowmobile trail follows gravel road south of the Site (sometimes referred to as Fire Road C), and traverses north of Mount Chase to south of Picket Mountain. The site would be visible from portions of this trail (also identified as local snowmobile trail 62). The site would not be visible from ATV/snowmobile trails located to the east, to the west of to the north. In summary, the site would be visible only to recreational trails located immediately south at distances from 0.9 to 1.2 miles. What would be visible is the top of the concentrator building where is stood above the tree line. The concentrator can be designed to blend in with the surrounding environment to reduce visibility from points such as this. Noise from the site will not impact these areas as discussed in Section 15 of this petition. The estimated level of use for the ATV trails is 500 trail riders per month and 700 trail riders per month for snowmobiles. Consultation with the nearby Katahdin Lodge was completed to provide guidance on usage and locations of trails.

Public Boat Launches

These are no public boat launches on ponds or lakes located within 3 miles of the site. There is a public boat launch on the north-eastern shore of Lower Shin Pond, but it is not located within 3 miles of the site. The site is not visible from either Lower or Upper Shin Pond. A more detailed review through investigation with the public is currently underway to confirm the number and level of use related to boat launches in the ponds within the 3-mile radius of the proposed boundary.

Attachment M

~~4.81.1 General Measures Undertaken to Assure Mining Will Not Have Undue Adverse Impacts on Existing Uses and Resources Including Measures to Avoid, Minimize or Mitigate Any Adverse Impacts~~

~~Please see Section 3 Project Description and Appendix A Section B(3)(d) Impacts on Existing Uses and Natural Resources. These sections discuss the environmentally responsible approaches used in modern mining to avoid and minimize any adverse impacts. During operation and post closure, an environmental monitoring plan for groundwater, surface water and sediment, with reporting requirement to the DEP will be in place. If such monitoring identifies an adverse impact, mitigation plans would be developed and implemented in consultation with the DEP. At this point in time, such impacts are not anticipated or expected.~~

7

Attachment N
Description of Socioeconomic Impacts of Proposed Mining Upon Immediate Area,
Adjacent Communities County and State

Please see Appendix A Section B(3)(b) Potential Short and Long Term Socioeconomic Impacts.

Attachment O
Evaluation of Sufficiency of Existing Services and Utilities, and General Measures to Increase Service Capacities (if required) including Burdens on Communities or Government to Provide Those Services

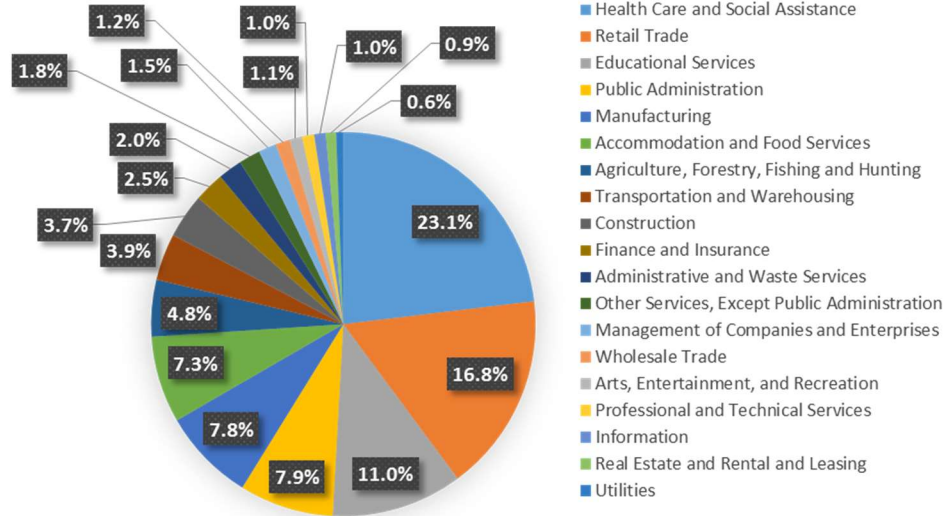
Description of Local Economy and Existing Local Services

The following sections describe the geographic distribution of employment within an approximate 30-mile distance from the proposed mine site. It is expected that a majority of employees for the mine will come from this population. Local services that will be used by this employed workforce within this geographic region are then described to assess burdens on communities and local government to provide needed services.

Local Economy and Workforce

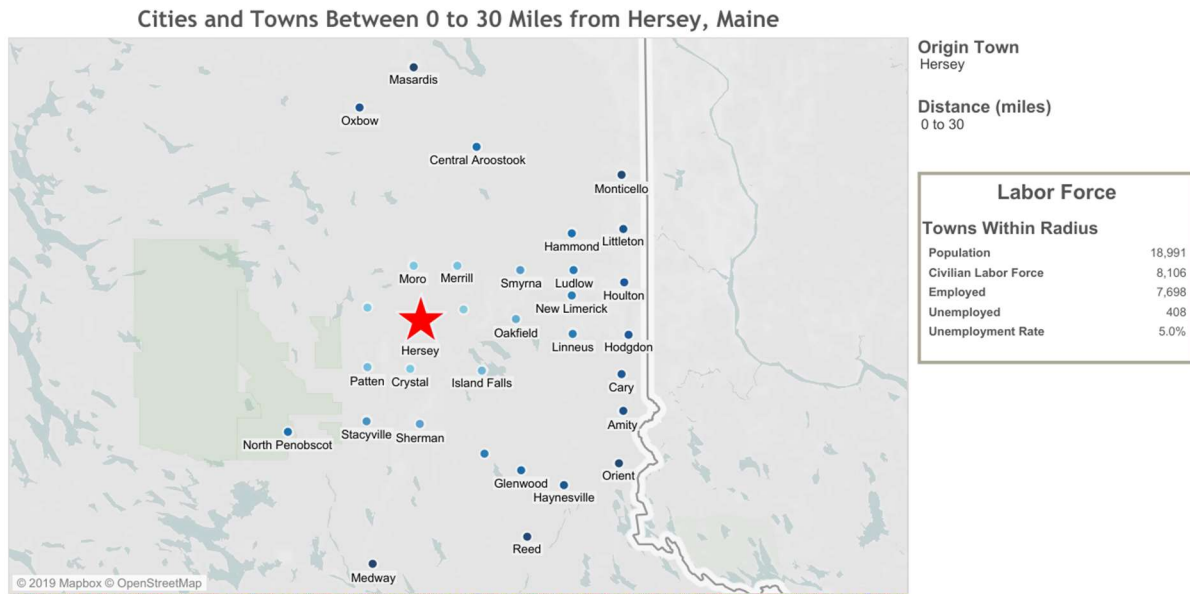
The regional economy has been dominated historically by timber harvesting and wood products industries including manufacturing in addition to tourism related service and retail businesses. Houlton, approximately 30 miles from the site, is the closest municipal service center and is also a designated Labor Market Area (LMA). The average employed population within the Houlton LMA in 2018 was listed as 6,016 by the Maine Department of Labor. The majority of employment was within service-producing industry sectors (83.6%) with the remainder goods producing (16.4%). Currently, employment in this local economy is dominated by health care, retail trade, education and public administration as depicted below from the same data source. The employment categories are ordered from highest to lowest, by percentage of total employment, and are consistent with the percentages provided on the pie chart.

Distribution of Employment in the Houlton LMA



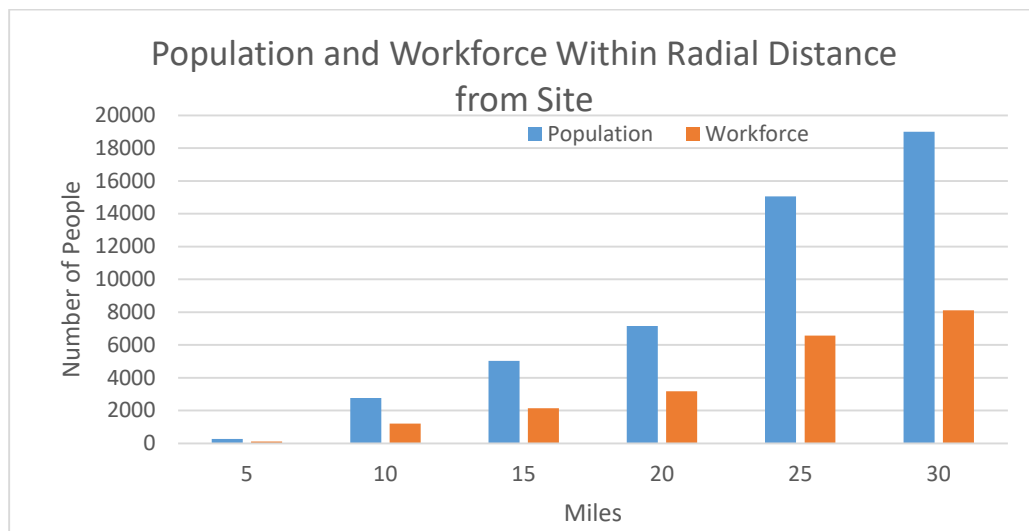
The employed population in the Houlton LMA has varied by only 1 to 2 percent over the last four years (2014-2018) and there has been little change in employment sectors; however average wages have risen approximately 10% over that same period according to Maine Department of Labor statistics.

Hersey Maine is the closest town to the site and is within the Houlton LMA. Within a 30 mile radius of Hersey, the employed labor force is comparable to, though slightly larger than, the Houlton LMA (8,106 versus 6,016).



Labor Force: 2018 annual average, Maine Department of Labor, Center for Workforce Research and Information. Population: 2018 United States Census Bureau.

The principal towns in proximity to the site (within a twenty-mile radius) are located to the south and east and include Stacyville, Sherman, Patten, Island Falls and Oakfield. Other communities include Hersey, Crystal, Moro, Merrill, Smyrna and Dyer Brook. Beyond twenty miles to Houlton, the population and available work force increases more than two fold as shown graphically below.



Operation of the mine, once constructed, will require full time employment of 60 individuals. The majority of these will be skilled labor positions requiring training. A training program will be established by Wolfden in advance of commencing mine operations so that a majority of these positions can be filled from within the local labor market.

It is the aim and objective of Wolfden to provide the maximum employment benefit locally. Based on demographics of the current population, it is reasonable to expect that approximately 40% of the workforce (24) could come from communities with 20 miles of the site and the remaining 60% of the workforce (36) from within 20-30 miles of the site and other more distant communities. This would equate to approximately 0.7% of the total employed work force within 30 miles from the site. Unemployment in the area averages approximately 5% (400 workers).

Communities in Proximity to the Site	
Within 20 Miles	Within 20-30 Miles
Crystal	Central Aroostook
Dyer Brook	Glenwood
Island Falls	Hammond
Moro, Merrill	Haynesville
Mount Chase	Hodgdon
Oakfield	Houlton
Patten	Linneas
Sherman	Littleton
Smyrna	Ludlow
South Aroostook	Masardis
Staceyville	Medway
	Monticello
	New Limerick
	North Penobscott
	Orient
	Oxbow
	Reed

The primary municipal services required by mine operations include solid waste disposal and potentially emergency response including fire and ambulance services. The primary municipal and community services that would be accessed by employees include education, housing, medical and healthcare services, and municipal solid waste disposal. Since it is anticipated that a majority of the employees will come from within the with the Houlton LMA there should be little net demand increase on services from towns or communities since the future employees are already using these services. It is assumed that 10% to 15% of the initial employees (6-9) will be imported into the work force area to provide a local management team with advanced skills and experience in mine operations. Once the local work force that is hired gains experience, it is likely some of these imported employee positions would be replaced by those local resident employees.

Description of Local Services

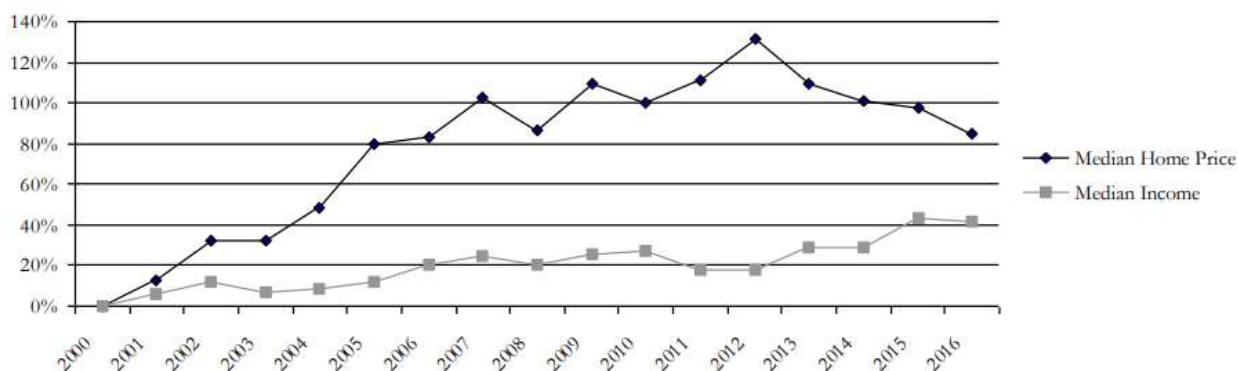
The following local services are described below: Housing, Education, Public Safety (Fire, Emergency Response, and Police), Healthcare and Municipal solid waste management.

Housing

Data on housing affordability in the Houlton LMA is available through [Mainehousing.org](https://www.mainehousing.org/docs/default-source/policy-research/housing-facts/2016/houltonlma2016.pdf?sfvrsn=5): <https://www.mainehousing.org/docs/default-source/policy-research/housing-facts/2016/houltonlma2016.pdf?sfvrsn=5>.

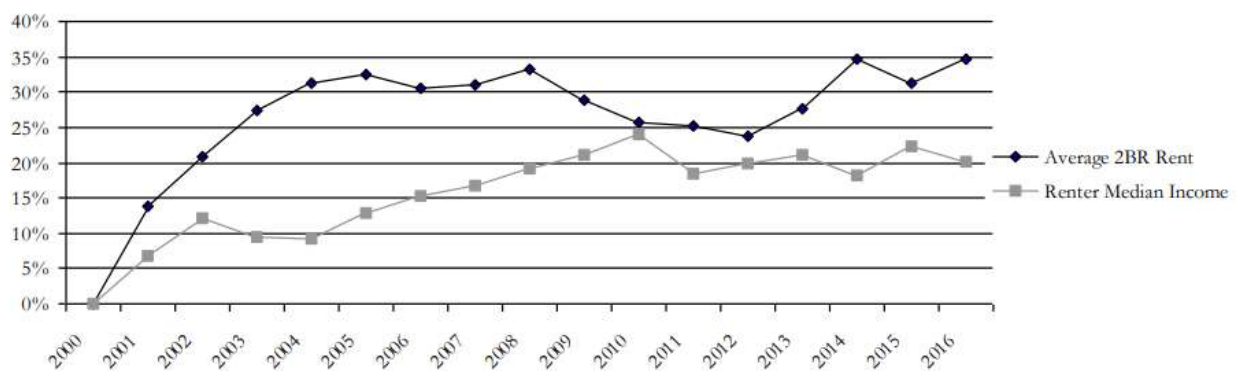
This data covers recent years from 2012 to 2016. During that time frame the median housing price has fallen, while median income has risen, thus increasing the number of households with the median income needed to afford the median home price. The average number of households unable to afford the medium home price in Maine is approximately 52%. This number drops to 25% in the Houlton LMA and down to 18% and 14% in Patten and Island Falls respectively. The trends in housing prices and income in the Houlton LMA are depicted in the following graph (source: Mainehousing.org cited above).

Relative Increases in Income and Home Price ³



The housing data for rental properties (2-bedroom rental units-2BR) from the same source indicates opposite trends in the local rental market. In Maine the average hourly 2016 wage needed to afford the average 2BR rental was \$16.77/hour and \$10.28 in the Houlton LMA. Given the average 2018 wage in the Houlton LMA was 16.85/hour, there is a shortage in affordable rental housing (44% unable to afford the average 2BR rent). Trends in in rent and renter income are depicted graphically below using 2000 as the baseline year for computing relative changes (source: Mainehousing.org cited above).

Relative Increases in Renter Income and Average 2BR Rent³



Burden on Housing Market

The proposed project will provide good wages above the Houlton LMA average wage and the prospect of steady employment for individuals who pursue this career. The effect on housing should be positive in that it will allow residents employed by Wolfden the prospect of affordable home ownership or the ability to successfully enter the rental housing market. There would be no burden on communities or municipalities with respect to housing. As the housing market has declined in recent years, the introduction of 60 new jobs in the local economy should have a positive effect on the local housing market where additional property transactions result.

Education Services

Within the labor market area as described previously, the public educational needs of families is served through four regional school districts including RSU 29, RSU 50, RSU 70 and RSU 89 as shown below. The current total student body from elementary school through high school is approximately 2,563 based on information from the Maine Department of Education. RSU 89 was recently formed from communities previously within RSU 50.

Regional Public Schools Serving Local Towns and Communities

School Year	SAU Name	School Name	Number of Students
2019	RSU 29/MSAD 29	Houlton Elementary School	423
2019	RSU 29/MSAD 29	Houlton High School	364
2019	RSU 29/MSAD 29	Houlton Junior High School	298
2019	RSU 29/MSAD 29	Houlton Southside School	319
2019	RSU 50	So-Aroostook School	358
2019	RSU 70/MSAD 70	Hodgdon Middle/High School	191
2019	RSU 70/MSAD 70	Mill Pond School	284
2019	RSU 89	Katahdin Elementary School	145
2019	RSU 89	Katahdin Middle/High School	181
Total	=	=	2,563

RSU No.	Communities Served
RSU 29	Houlton, Hammond, Littleton, and Monticello
RSU 50	Crystal, Dyer Brook, Hersey, Island Falls, Merrill, Oakfield, and Smyrna
RSU 70	Amity, Cary Plantation, Haynesville, Hodgdon, Ludlow and New Limerick
RSU 89	Mount Chase, Patten, Sherman and Stacyville

4.91.1 Burden on Education Services

As discussed previously it is anticipated the majority of the mine work force will be employed from Maine residents within the Houlton LMA. Initially, some of the work force may be imported into the area. These imported workers would contribute to the local economy through spending and taxes. Therefore, there may be a small increase in student enrollment in some school districts. This increase however should be small and would not represent a disproportionate burden. Otherwise it is expected that current or future educational needs of existing residents who become employed by Wolfden are already being met or anticipated and would not represent a burden on services. RSU 89, located closest to the site in Stacyville confirmed that the expected level of additional educational services is not a burden (see attached concurrence letter).

4.101.1 Public Safety Services

Services related to public safety include fire, 9-1-1 emergency response / ambulance and police services. Some of these services are provided by local towns while others are provided at the County Level.

The project site, when including private access roads, falls within both Penobscot and Aroostook counties. Each county has its own Regional Communication Center which acts as a dispatch Public Safety Answering Point (PSAP) operating on a 24-hour basis to answer and relay 9-1-1 calls, or directly dispatch emergency

~~services. The Penobscot RCC, located in Bangor, supports residents in both Penobscot and Aroostook counties. The Aroostook RCC is located in Houlton and responds to all 9-1-1 calls originating in the county. The facility is housed collectively with Maine State Police Troop F, Maine Warden Service, Maine Forest Service and the Maine Fire Marshalls office. The Aroostook RCC handles dispatches for all state public safety agencies including the Aroostook County Sheriff's Department, the County office of Emergency Management and local fire departments including Oakfield.~~

~~Locally, several of the towns closest to the site have volunteer fire departments including Patton, Island Falls, Sherman and Oakfield. Island Falls also has an enhanced 9-1-1 Ambulance service. Island Falls has indicated its ambulance and fire response capabilities is sufficient to conceptually support Wolfden's plan and potential need for services (see attached concurrence letter)~~

~~Police services, primarily law enforcement, are provided through the Aroostook County Sheriff's Department in Houlton and the Penobscot County Sheriff's Department in Bangor. Law enforcement is also supported by the Maine State Police Troop F which is responsible for police coverage for all of Aroostook County and the northern parts of Penobscot, Piscataquis and Somerset Counties.~~

4.111.1 Burden on Public Safety Services

~~The proposed mine will be developed incorporating fire protection standards for building design and related structures. The mine will be operated under a very strict and well defined safety program and in conformance with OSHA General Industry standards which also include requirements for medical, first aid and fire protection. Wolfden will provide for any fire response underground as this requires specialized training and equipment. With exception of volunteer fire, public safety services are implemented and funded at the county level. Wolfden's mining operations will provide a tax base that will contribute to the state and county services.~~

~~It is not expected that mine operations will place a significant burden on public safety services.~~

~~It is noted that in recognition of the decline in number of volunteer fire fighters in Maine, in 2017 the Maine Legislature passed a pension system for volunteers based on time of service (Maine Length of Service Award Program). The state of Maine does have a Volunteer Fire Assistance (VFA) Program for rural fire departments to provide federal financial and technical support in the form of matching fund grants that meet specific established criteria. Wolfden is sensitive to the volunteer nature of fire fighting services within the communities near the proposed project.~~

4.121.1 Healthcare and Medical Service

~~The Houlton Regional Hospital is a major regional hospital that provides a full range of medical services. Other medical services are also available from private physicians practicing in the area.~~

~~The Katahdin Valley Health Center has two facilities in Patten. One covers primary and dental care and includes a pharmacy. The second center is primarily engaged in occupational physical therapy and chiropractic care.~~

~~4.131.1~~ Burden on Healthcare and Medical Services

~~There are abundant sources for medical services in the area. Health care and social services is the largest employment sector in the Houlton LMA. The proposed mine will not burden healthcare and medical services in the area.~~

~~Municipal Solid Waste Disposal~~

~~Solid waste management in the area is serviced by Casella Waste Management, including the Pine Tree Waste transfer station in Houlton and the Northern Katahdin Valley Waste Disposal District in Dyer Brook. This district serves the communities of Amity, Crystal, Dyer Brook, Hammond, Hersey, Island Falls, Merrill, Moro Plantation, Mount Chase, Patton and New Limerick. The facilities offer commercial and municipal waste disposal transfer. There would be no burden on these services as they are paid for services.~~

~~4.141.1~~ Power and Utilities

~~Power and other utilities are addressed elsewhere in this Petition. The project will have to import power and will provide its own source of water, for drinking purposes. Sanitary disposal of gray and black water will be managed through a septic field. There are no burdens to towns or municipalities for these services.~~

Concurrence Letters

Attachment P

Explanation of How This Proposal is Consistent with the Standards and Purpose of the D-PD Development Subdistrict

Consistency with D-PD Development Subdistrict Standards

The proposed project will be conducted within a D-PD Development subdistrict consistent with standards for said subdistrict and within the intent and provisions of 12 M.R.S.A. Chapter 206A. Under Chapter 685-B, Development Review and Approval, a permit is not required for mining of metallic minerals that is reviewed under the Maine Metallic Mineral Mining Act. This project will require review and permitting under the DEP Chapter 200 Metallic Mineral Exploration, Advanced Exploration and Mining since all metallic mineral mining activity within a D-PD district is permitted through the DEP. The LUPC must certify to the DEP that the proposed development is an allowed use and that the proposed development meets applicable land use standards established by the LUPC, not otherwise considered by the DEP review.

The mineralized rock at the Pickett Mountain Deposit contains high grade zinc, and lesser copper, lead, gold and silver at tonnages indicating the project is economically feasible, and can be financed and completed. Financial capacity and project financing are discussed in Exhibit H. Wolfden, through its own engineering staff, its current specialized consultants in metallurgy and tailings management, supported by the mining engineering capabilities of Wood, has the technical capacity and expertise to design, construct and operate the project through final reclamation. Site, T6R6 WELS, Maine.

The project schedule is dependent on the issuance the LUPC's approval of this Petition. Wolfden anticipates this process could take up to a year from the date of the Petition. Wolfden will conduct any additional required natural resource studies in spring and summer of 2020 (wetland, flora, wildlife habitat, and archeological resources). Wolfden also intends to work with the Maine DEP to establish a baseline environmental characterization program that will require two years of data collection to complete. Once completed the mine permit application will be submitted for DEP review. It is anticipated that review and public comment could take up to one year. This could potentially allow the construction phase of the project to commence in 2023-2024. The duration of mining would be 10 years from that point.

Based on preliminary correspondence with the MDIF&W and DEC Natural Areas Division and current information from preliminary site surveys, potential impacts to protected wildlife, habitat and flora within and adjacent to areas proposed for development should be limited to areas containing forested wetland and associated intermittent streams within upland areas. Correspondence with these agencies is discussed in Section 18 and presented in Attachment N. Wolfden is committed to working with the agencies to avoid impacts to the extent possible, to minimize impacts and compensate where unavoidable. In this manner, the functions and values of upland wetlands and streams within the local Pickett Pond / Pleasant Lake watershed that are important to wildlife habitat and surface water quality can be maintained during the

active life of the project. Upon reclamation, impacts that were initially unavoidable can be restored / replaced in-kind where originally located.

The project location is approximately 6 radial miles from Patten, the closest town. The project location is entirely dependent on the presence and location of a potentially economic mineral deposit. The project location is exempt by definition from adjacency. The proposed rezoning includes 528.2 contiguous acres which meets the minimum requirements under Chapter 10 (10.21,H (D-PD)) of 50 acres for metallic mineral extraction projects. Of this, approximately 107 acres will result in surface disturbance to construct necessary mining facilities. Other areas within the contiguous 528.2 acre area potentially contain wetlands and will be avoided to the extent practical. Wolfden has evaluated project mining requirements to minimize the footprint of the proposed project and to place above ground facilities adjacent to each other to construct a compact and efficient operations area. The remaining area to be rezoned encompasses the subsurface areas of mineralized rock and subsurface treated water infiltration galleries, and buffers around surface facilities. The rezoning will occur entirely within a General Management subdistrict and is not adjacent to and will not impact Protection subdistricts in affect at this time. Within a three-mile radius of the site, the protection subdistricts present include forested and scrub-shrub wetlands adjacent to great ponds (Pickett Pond, Pleasant Lake and Mud Lake) and associated stream drainages, and wetlands of special significance between Mud Lake and Pleasant Lake. Fish and wildlife subdistricts are located to the northwest. A recreation subdistrict is designated surrounding Green Mountain Pond and Lane Brook Pond, located greater than 3 miles from the site. The location maps showing the existing conditions, proposed structures and existing and proposed subdistrict boundaries are provided in Exhibit D-1 and D-2.

Collectively, Exhibit D-2 and the project description under Section 4 constitute the preliminary development plan for the project. The Final development plan will be reflected in designs provided in the Maine DEP Chapter 200 permit application. The proposed land use activities and structures that would be allowed in the Pickett Mountain (D-PD) planned development subdistrict follow at the end of this section.

As discussed in Section B (3)(d) and Appendix A Attachment Q, the project operations will include comprehensive engineered facilities to collect and treat waters that come in contact with rock and earthen materials that are mined in the subsurface and brought to the land surface for beneficiation or long-term management. These water collection, treatment and treated water recharge facilities will substantially protect groundwater and surface water quality during and after active mining. The plan for mine reclamation outlined in Attachment Q describes how the affected areas will be restored and returned to pre-existing or comparable conditions including forested habitat at the end of the project.

As described in this Petition, the project is located at distances greater than 400 feet from any property line, is reasonably self-sufficient and self-contained, provides for its own water and

domestic sewage services, maintenance of roads, solid waste disposal and to the extent possible, fire protection and security.

This Petition contains discussion of all the criteria under Chapter 12 of the LUPC's rules for Mining and Level C Mineral Exploration Activities (Appendix A).

Attachment Q

Description of the Anticipated Site Conditions Following Closure and the Potential for Future Reclamation and Beneficial Use of the Affected Area:

As described in earlier sections of this Petition, the mine (Dry Tailings Facility, Mill Feed Staging Area, Interim Waste Rock Storage Facility, Surface Water Management Facility) will be constructed in a manner to capture contaminated water run-off for collection, treatment and management.

At Pickett Mountain, there will be 3 classes of structures. Class 1 is a permanently fixed structure that will remain post closure of the property. Specifically, this will be the dry TMF. Class 2 is a non-permanent structure that is deemed acceptable to decommission and remove only after the site has been deemed ready for rezoning back to a General Management (M-GN) Subdistrict. Specifically, this will be the water management and water treatment facilities including all drainage and water collection structures. Class 3 is a non-permanent structure that is decommissioned and removed as soon as production operations cease. Specifically, this includes all buildings on-site that are not related to water collection and treatment, mill feed and waste rock storage pads, and non-essential roadways.

Upon completion of mining and processing of material from the Pickett Mountain mineral deposit, all class 3 structures will immediately be decommissioned and sold, or, to the extent practical, demolished and deconstructed to allow inert materials to be placed in remaining open underground workings (raises and drifts as discussed in Section 4 Project Description). The land surface will then be contoured and smoothed to reasonably match the original landscaping. This closure work will be conducted under an approved erosion and sedimentation control plan. Material from the overburden storage areas (original soils stripped prior to mine construction) will be placed on top of the regraded surface as final soil cover to support natural growth of vegetation. Openings to surface from underground that are non-essential will be plugged and capped with engineered concrete or steel plugs to ensure future access cannot happen either purposefully or not. All precipitation that contacts these locations will continue to be collected and monitored for water quality and treated before being discharged. After removal of all class 3 structures, it is anticipated that water quality of run-off being collected and treated will already begin to improve.

Class 1 structures will remain in place into perpetuity. Concurrently with the placement of tailings on the TMF, the TMF will be reclaimed through progressive capping and revegetating. Therefore, the final reclamation will be to cover the TMF with an engineered clay or silt cap constructed from local borrow sources. After it is capped and contoured to support precipitation drainage, the TMF will be covered with a final soil layer using the remaining material from the overburden storage areas. This will support regrowth of natural vegetation and long-term, permanent erosion control. Precipitation that falls on the TMF will drain off around the perimeter of the facility. The restoration design will include appropriately sized and constructed drainage features to handle storm events, consistent with DEP's stormwater management requirements. With all the class 1 and class 3 structures being closed or removed, the remaining site features will not adversely impact the water quality of run-off that is being

collected and treated prior to discharge. After roughly 1 year post-complete closure, it is anticipated that the drainage water from site will be back to historical quality and no longer require treatment. After this has been confirmed, Wolfden will decommission, remove and sell the water management facility. The water management facility will be excavated and inert material (demolition debris) placed underground and the area recontoured. A final engineered plug will be placed in the portal area to completely and permanently block access to any underground workings.

Once final reclamation work is completed, continued post-closure monitoring of surface water and groundwater will take place for a duration that is specified in the DEP mining permit. Within the first year, samples will be taken frequently, following the sampling requirements established for operating the property. Within the second year, sampling intervals will decrease as confidence in the quality of closure increases. This will continue for 5 years until the sampling frequency is minimized to one time per year. The frequency of monitoring will be established statistically based on water quality trends and data.

The property will then be rezoned. Land use restrictions and deed covenants will be instituted over land occupied by the tailings facility to ensure that no industrial or commercial activity occurs over that portion of the site post closure.

Beneficial re-use of the property will include timber harvesting as it occurs presently outside the tailings facility footprint. Also, the portal will be closed in a manner that will allow entry underground to bats, providing valuable habitat. Recreational uses will be allowed on the property including hunting, hiking, atv-ing, etc. Restriction would be placed on the tailings facility in order to protect that area from damage by off road vehicles. In order to ensure protection of the tailings facility area, a series of permanent signs will be posted around the perimeter restricting access to authorized personnel only. In addition, if any future transfer of land ownership were to take place, the deed within the tailings area would restrict the use of heavy equipment or any small vehicles and recreational vehicles to ensure that damage to the tailings cover is mitigated.

Attachment R

LUPC – LUPC Memo Picket Mtn Pond Butterfly

Wolfden Mt. Chase LLC

EXHIBIT 26 – ADDITIONAL INFORMATION

26 Additional Information

4.1526.1 Proposed Land Use Activities and Structure Allowed in the Picket Mountain (D-PD) Planned Development Subdistrict

~~This Petition contains preliminary locations and dimensions of new buildings and structures required for the project. During detailed engineering analysis and planning in support of the mine permit application to the DEP, these preliminary locations and dimensions may change. Changes may reflect improvements in the efficiency of the project, environmental management of the site, and comments by the DEP.~~

~~The following land use activities and structures are~~Land uses ~~anticipated for the Pickett Mountain (Mtn. D-PD) Planned Development Subdistrict, including:~~ subdistrict include:

- ~~• A.——Uses and activities allowed without a permit;~~
- ~~• B.——Uses allowed without a permit subject to standards; and~~
- ~~• C.——Uses and activities allowed with a permit or by special exemption.~~

~~**A.——Land use activities and structures allowed in the**~~The Pickett Mountain (Mtn. D-PD) Planned ~~subdistrict is an undivided, custom subdistrict. Except as specified in this Development Subdistrict~~Plan, the following uses are allowed within the subdistrict.

26.1.1 Uses Allowed Without a Permit

The following uses are allowed without a permit within the Pickett Mtn. D-PD subdistrict.

- ~~1.——Motorized vehicular traffic on roads and trails.~~
 - ~~2.——Snowmobile traffic on and off roads.~~
 - ~~3.——Electrical Services Construction, installation, servicing, maintenance, including electrical Service drops and High/Medium/Low Voltage service~~
 - ~~4.——Mineral exploration activities, including geophysical investigations.~~
 - ~~5.——Surveying and other natural resource analysis.~~
 - ~~6.——Signs listed as exempt in Section 10.27, J, 1 of the LUPC's Land Use Districts and Standards.~~
 - ~~7.——Temporary lighting equipment.~~
- 1) Baseline and ongoing environmental monitoring and data collection necessary to finalize design and establish and maintain compliance with applicable State regulatory requirements, including the requirements of the MDEP's Chapter 200 rules, 06-096 CMR 200;

1)2) Emergency operations conducted for the public health, safety or general welfare, such as emergency medical response, firefighting, law enforcement, resource protection, and other search and rescue operations;

8. ~~The general management, operations and maintenance of roads, structures, above ground and subsurface utilities~~

9. ~~Shipping and receipt of materials~~

10. ~~On-site and Off-site management of solid waste generated on-site.~~

2)3) Forest management activities, except for timber harvesting;

11. ~~The operation of vehicles, vehicular equipment on existing roads, service roadways and associated areas.~~

12. ~~The repair, and maintenance of vehicles, vehicular equipment, and other equipment in on-site maintenance buildings and areas and emergency repairs in on-site maintenance building and other facilities including roads, service roadway, and associated areas.~~

3)4) Hunting and trapping of wild animals, provided such hunting and trapping is conducted at least 500 feet away from existing development including legally existing structures;

13. ~~Decommissioning of all installed infrastructure~~

14. ~~Environmental work~~

15. ~~Security Services~~

~~B. Land use activities and structures allowed in the Pickett Mountain (D-PD) Planned Development Subdistrict without a permit subject to standards~~

1. ~~Expansion of a building approved as part of the mining permit issued by DEP, so long as it does not add or change uses to the building.~~

2. ~~Construction, operation and maintenance of all subsurface facilities and assets related to mineral extraction, backfilling and closure of such facilities, including but not limited to additional surface facilities not envisioned at this time but could be needed in the future to support subsurface operations including ventilation shafts, raises, surface shafts and attendant headworks to facilitate deeper ore removal.~~

3. ~~Importation of electrical power via a new utility line constructed by others~~

5) Road Primitive recreation;

6) Motorized vehicular traffic on roads and trails, parking areas, storage pads, and similar legally existing impervious surfaces, including snowmobile and all-terrain vehicle traffic on-and off roads;

7) Normal maintenance and repair.

4. ~~The repair and maintenance activities, including grading, replacement of gravel travel surface, widening, maintaining shoulders, drainage and trimming vegetation.~~
5. ~~Increase in the amount of cleared area within the subdistrict.~~
6. ~~Minor modifications of the location or design of buildings of vehicles, vehicular equipment, and other structures approved pursuant to a permit, which are made necessary or preferable to unforeseen conditions. Minor changes to be allowed under this section may include:~~
 - a. ~~Relocation of exterior lighting within 50 feet of the location(s) shown on the approved plans;~~
 - b. ~~Relocation or realignment of roadways or alignment(s) shown on the approved plans; mobile equipment provided that required erosion control systems are adjusted accordingly;~~
 - d. ~~Relocation of culvert(s) within 50 feet of the location(s) shown on the approved plans;~~
 - e. ~~Relocation of water treatment repair and management facilities, including subsurface piping, including those for domestic wastewater~~
 - c. ~~Fuel storage tanks for operation of heating and backup power generation;~~
- 4)8) ~~Constructed ponds: Creation, alteration or maintenance of constructed ponds of less than 4,300 square feet in size which are not fed or drained by flowing waters, provided they are constructed and maintained in conformance with the vegetative buffer strip requirements of Section 10.27,C,2,a. activities occur in on-site maintenance buildings to the fullest extent practicable; and~~
- 9) ~~The normal maintenance and repair of legally existing structures (including underground or subsurface structures), parking areas, lined pads; and other impervious surfaces, provided that adequate measures are taken to control runoff and minimize soil erosion;~~
- 10) ~~Security operations conducted for public health, safety, or general welfare, and the protection of onsite personnel, equipment, and assets;~~
- 11) ~~Shipping and receiving of materials;~~
- 12) ~~Surveying and other resource analysis; and~~
- 13) ~~Wildlife and fishery management practices.~~

26.1.2 Uses Allowed Without a Permit Subject to Standards

The following uses are allowed without a permit within the Pickett Mtn. D-PD subdistrict subject to applicable standards.

- 1) Accessory structures: New structures accessory to any structures and uses reflected on the Site Layout and Facilities Plan, provided that:
 - a. The total square footage of the footprint of all new accessory structures built within a two-year period is not more than 750 square feet; and
 - b. All other requirements and standards of the Commission's Chapter 10, Section 10.27(P) are met;

2) Checkpoint buildings (note the footprint of a checkpoint building is excluded from the limit of accessory structures in b.(1)(a) above);

1)3) Filling and grading: associated with uses allowed in the D-PD subdistrict;

~~7. Clearing and grubbing and maintenance of topsoil pens for later use in site restoration/reclamation.~~

~~8. Mineral exploration activities: Level A and B mineral exploration activities, excluding associated access ways:~~

~~9. Road projects: Level A road projects.~~

~~10. Maintenance of employee parking areas within the mine operations area~~

~~11. Service drops.~~

~~12. Signs.~~

~~13. Exterior lighting~~

~~14. Storing and utilizing explosives assigned for underground.~~

~~C. Land uses and activities allowed in the Pickett Mountain (D-PD) Planned Development Subdistrict requiring a permit.~~

~~15. Mineral (natural) resource extraction, crushing and processing including all related metallic mineral mining activities and Tier one advanced exploration and all related support activities required for the safe and environmentally secure execution of the mining, crushing and processing activities.~~

~~16. Construction, operation and maintenance of buildings, pads, office facilities and attendant structures for the sorting, milling, processing of the mineral resource and shipping off-site of mineral concentrates~~

~~17. Construction, operation and maintenance of water treatment facilities and attendant structures for the collection, conveyance of waters, and re-infiltration of treated waters.~~

~~18. Construction, operation and maintenance of lined facilities for eventual and permanent management of dry stacked tailings.~~

~~2)4) Constructed ponds: Creation, alteration or maintenance of constructed ponds 4,300 square feet or greater in size which are not fed or drained by flowing waters, or of such ponds less than 4,300 square feet in size which are not, in conformance with the vegetative buffer strip requirements of Section 10.27,C,2,a. for such activities in Chapter 13 of the Commission's rules;~~

~~19. Draining or altering the water table or water level for other than mineral extraction.~~

5) Filling and grading, which is not Road projects: Level A road projects in conformance with the standards of requirements for such activities in Chapter 10, Section 10.27(D) of the Commission's rules;

- 6) Service drops to legally existing structures;
- 3)7) Signs in conformance with the requirements for such activities in Chapter 10, Section 10.27,F.(J) of the Commission's rules; and
- 8) Road projects: Level B and C road projects, except for water ~~Water~~ crossings as provided for in of minor flowing waters in conformance with the Chapter 10, section 10.27(D) of the Commission's rules.

26.1.3 Uses Requiring a Permit

The following uses, and related accessory structures, are allowed within the Pickett Mtn. D-PD subdistrict upon issuance of a permit by LUPC or DEP, as applicable.

- 1) Water Storage and Collection Ponds, provided that:
 - a. The ponds are in conformance with the Site Layout and Facilities Plan Option 3 Envelopes (Figure 26-1) ("Site Layout and Facilities Plan");
 - b. The footprint of the ponds may be less than depicted on the Site Layout and Facilities Plan. A footprint expansion is allowed if: (i) the expansion will not exceed a total maximum footprint increase of 85,000 square feet for the lifetime of the subdistrict based on the total footprint of ponds shown on the Site Layout and Facilities Plan; and (ii) the expansion will be located within an applicable development area envelope, as shown on the Site Layout and Facilities Plan;
- 2) Infiltration Galleries, provided that:
 - a. The galleries are in conformance with the Site Layout and Facilities Plan and located in the applicable development area envelope;
 - b. The footprint of the galleries may be less than depicted on the Site Layout and Facilities Plan. The footprint of the galleries may be increased, and locations adjusted as long as the galleries are located within the applicable development area envelope, as shown on the Site Layout and Facilities Plan.
- 3) Lined Storage Pads for authorized metallic mineral mining activities provided that:
 - a. The pads are in conformance with the Site Layout and Facilities Plan;
 - b. The footprint of the pads may be reduced in size from what is depicted on the Site Layout and Facilities Plan. The footprint of the pads may be increased if (i) the increase in size will not exceed a total maximum footprint increase of 92,000 square feet for the lifetime of the subdistrict based on the total footprint of lined pads shown on the Site Layout and Facilities Plan; and (ii) the footprint of the pad will be located within an applicable development area envelope as shown on the Site Layout and Facilities Plan.
- 4) Tailings management facility, provided that:
 - a. It is in conformance with the Site Layout and Facilities Plan and located within the applicable development area envelope;

- b. The footprint of the tailing's management facility may be less than depicted on the Site Layout and Facilities Plan. The footprint may be increased, and the location adjusted as long as it is within the applicable development area envelope as shown on the Site Layout and Facilities Plan.
- 5) Driveways;
- 6) Land management roads;
- 4)7) Metallic mineral mining activities: In addition to those activities more specifically identified in this section, metallic mineral mining activities, as defined in Chapter 10, Section 10.21,A,3,b.02 and that are in conformance with the Site Layout and Facilities Plan including, but not limited to, subsurface facilities and assets necessary to conduct metallic mineral mining activities and not specifically listed on the Site Layout and Facilities Plan as well as above structures and uses identified on and in conformance with the Site Layout and Facilities Plan;
- 8) Signs-Mineral exploration activities: Access ways for Level A and B mineral exploration activities, and Level A and B mineral exploration activities which are not in conformance with the standards of Chapter 13 of the Commission's rules;
- 9) On-site storage and disposal of land clearing and construction debris in compliance with applicable MDEP rules;
- 10) Stormwater management structures;
- 11) Subsurface septic system;
 - a. Relocations: Relocations of metallic mineral mining activities that are shown on the Site Layout and Facilities Plan provided that the relocated activity;
 - b. Will be located within an applicable development area envelope as shown on the Site Layout and Facilities Plan;
 - c. Does not involve the addition of a land use not previously approved in the Development Plan;
- 2)12) Road projects: Level A road projects not in conformance with the requirements for such activities in Chapter 10, Section 10.27,J,(D) of the Commission's rules; and Level B and C road projects;
- 13) Signs that are not in conformance with the standards of Chapter 10, Section 10.27(J) of the Commission's rules;
- 14) Solar energy systems, including grid-scale solar energy generation facilities, located within the applicable development area envelope;
- 15) Structures: New structures that are not shown on the Site Layout and Facilities Plan or expansion of structures shown on the Site Layout and Facilities Plan provided that the new or expanded structures;
 - a. Will be located within an applicable designated development area as shown on the Site Layout and Facilities Plan;
 - b. Will not exceed a total maximum structure footprint increase of 20,000 square feet for the lifetime of the subdistrict based on the total structure footprint shown on the Site Layout

and Facilities Plan (this limit does not apply to the infiltration galleries, the tailings management facility, constructed ponds, or lined storage pads, which may be expanded in accordance with sections c.(1)-(4) above);

c. Will not exceed 75 feet in height as measured from the lowest adjacent grade; and,

d. Will not involve the addition of a land use not previously approved in the Development Plan;

16) Timber harvesting;

17) Utility facilities, above ground and underground electric utility lines excluding service drops, and wire and pipe line extensions which;

18) Ventilation shafts, raises, surface shafts and attendant headworks that are needed to facilitate deeper ore removal and provide for safe working conditions in the mine;

3)19) Spray irrigation or evaporation as long as any structures associated with such activity do not meet the definition of service drops; exceed 20,000 square feet; and,

20. Water impoundments and ponds for water storage, treatment or detention.

21. All potential electrical work including High/Medium/Low Voltage service installation, operation and maintenance, including installation of cables, and associated infrastructure

4)20) Other uses and structures, uses, or services which identified on the LUPC determines are consistent with the purposes of this subdistrict and of the Comprehensive Land Use Site Layout and Facilities Plan and are not detrimental to the resources and uses they protect, and are of similar type, scale and intensity extent not otherwise expressly authorized as other uses under this allowed with or without a permit.

26.1.4 Prohibited Uses

All uses not expressly allowed, with or without a permit, shall be prohibited in the Pickett Mtn. D-PD subdistrict.

Wolfden Mt. Chase LLC

Exhibit 26: Attachment A - Figures

Exhibit 26 Figures Include:

Figure 26-1 - Site Layout and Facilities Plan

Wolfden Mt. Chase LLC

Exhibit 26: Attachment B - Reports

Exhibit 26 Supporting Documents Include:

Not Applicable Wolfden will continue developing the list of rules, definitions, and standards with the LUPC and DEP staff.